DOCUMENT RESUME

ED 055 993 SP 005 359

TITLE	Training, Recruitment and Utilization of Teachers in Primary and Secondary Education. Statistical Datas: Canada, Spain, Iceland, Japan, Norway, Turkey, United States.
INSTITUTION	Organisation for Economic Cooperation and Development, Paris (France). Directorate for Scientific Affairs.
PUB DATE	69
NOTE	134p.
AVAILABLE FROM	OECD Publications Center, Suite 1305, 1750 Penna. Ave., N.W., Washington, D.C. 20006 (single copy $3.20)
EDRS PRICE	MF-$0.65 HC-$6.58
DESCRIPTORS	*Statistical Data; *Teacher Education; *Teacher Recruitment; *Teacher Supply and Demand
IDENTIFIERS	Canada; Iceland; Japan; Norway; Spain; Turkey; United States

ABSTRACT

This is one of a series of studies on the training, recruitment, and utilization of teachers in member countries of the Organization for Economic Cooperation and Development. This volume consists of short papers, statistical data, and a note on the teacher training process for the following countries which were not the object of a national case study: Canada, Spain, Iceland, Japan, Norway, Turkey, and the United States. The material on Spain and Turkey is in French with no translation. Related documents are SP 005 358 and SP 005 360 through SP 005 364. (MBM)

SP

ED055993

FORMATION, RECRUTEMENT ET UTILISATION DES ENSEIGNANTS

TRAINING, RECRUITMENT AND UTILISATION OF TEACHERS

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

STATISTIQUES

STATISTICAL DATAS

ENSEIGNEMENTS PRIMAIRE ET SECONDAIRE

PRIMARY AND SECONDARY EDUCATION

CANADA ESPAGNE ICELAND JAPAN
NORWAY TURQUIE UNITED STATES

SP005359

DIRECTION DES AFFAIRES SCIENTIFIQUES
DIRECTORATE FOR SCIENTIFIC AFFAIRS
ORGANISATION DE COOPÉRATION ET DE DÉVELOPPEMENT ÉCONOMIQUES
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT
1969

1/2

L'Organisation de Coopération et de Développement Economiques a été instituée par une Convention signée le 14 décembre 1960, à Paris, par les membres de l'Organisation Européenne de Coopération Economique, ainsi que par le Canada et les Etats-Unis. Aux termes de cette Convention, l'OCDE a pour objectif de promouvoir des politiques visant :

- *à réaliser la plus forte expansion possible de l'économie et de l'emploi et une progression du niveau de vie dans les pays Membres, tout en maintenant la stabilité financière, et contribuer ainsi au développement de l'économie mondiale;*
- *à contribuer à une saine expansion économique dans les pays Membres, ainsi que non membres, en voie de développement économique;*
- *à contribuer à l'expansion du commerce mondial sur une base multilatérale et non discriminatoire, conformément aux obligations internationales.*

La personnalité juridique que possédait l'Organisation Européenne de Coopération Economique se continue dans l'OCDE, dont la création a pris effet le 30 septembre 1961.

Les membres de l'OCDE sont : la République fédérale d'Allemagne, l'Autriche, la Belgique, le Canada, le Danemark, l'Espagne, les Etats-Unis, la Finlande, la France, la Grèce, l'Irlande, l'Islande, l'Italie, le Japon, le Luxembourg, la Norvège, les Pays-Bas, le Portugal, le Royaume-Uni, la Suède, la Suisse et la Turquie.

The Organisation for Economic Co-operation and Development was set up under a Convention signed in Paris on 14th December 1960 by the Member countries of the Organisation for European Economic Co-operation and by Canada and the United States. This Convention provides that the OECD shall promote policies designed:

- *to achieve the highest sustainable economic growth and employment and a rising standard of living in Member countries, while maintaining financial stability, and thus to contribute to the world economy;*
- *to contribute to sound economic expansion in Member as well as non-member countries in the process of economic development;*
- *to contribute to the expansion of world trade on a multilateral, non-discriminatory basis in accordance with international obligations.*

The legal personality possessed by the Organisation for European Economic Co-operation continues in the OECD which came into being on 30th September 1961.

The members of OECD are Austria, Belgium, Canada, Denmark, Finland, France, the Federal Republic of Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States.

Afin de faire le point sur la situation du corps enseignant au niveau de l'enseignement primaire et secondaire tant sur le plan quantitatif que sur le plan qualitatif, dans les années récentes et dans le futur, le Comité du Personnel Scientifique et Technique de l'OCDE a décidé d'entreprendre une étude de synthèse reposant sur des données de base recueillies dans un certain nombre de pays Membres de l'OCDE et consignées dans des monographies nationales. Cette série de monographies nationales, publiée en six volumes par les soins de l'Organisation, est complétée par les présentes annexes. Ce volume inclut les principales statistiques intéressant les enseignants (dont la formation est décrite dans une note liminaire) des pays Membres n'ayant pas fait l'objet d'une monographie nationale.

In order to take stock of the current and future teacher situation in primary and secondary education, both in quantitative and qualitative terms, the Committee for Scientific and Technical Personnel of OECD decided to prepare a general report on this subject which would synthesise the data gathered in a certain number of OECD Member countries and which are presented in a series of country case-studies. This series of case-studies, published by the Organisation, in six volumes, is completed by the following annexes. The volume includes statistical data on teachers in countries not covered by a case-study. For each of these countries, the teacher training process is summarily described in an introductory note.

PREFACE

Le Comité du Personnel Scientifique et Technique de l'OCDE a témoigné un vif intérêt aux problèmes soulevés par l'offre et la demande de personnel enseignant. Ce dernier est vite apparu comme un élément fondamental du développement quantitatif et qualitatif du système d'enseignement. La recherche d'un équilibre entre l'offre et la demande de personnel enseignant nécessite la mise en oeuvre de politiques spécifiques de formation, de recrutement et d'utilisation intéressant l'un des secteurs les plus importants de la main-d'oeuvre hautement qualifiée.

A l'occasion d'études globales des "ressources en personnel scientifique et technique dans les pays de l'OCDE" et de la "politique générale et de la planification en matière d'enseignement" dans de nombreux pays Membres et dans un rapport plus spécialement consacré aux "effectifs, au recrutement et à la formation des professeurs de sciences et de mathématiques", certains aspects des problèmes soulevés par la demande et l'offre de personnel enseignant avaient été mis en lumière.

Afin de faire le point sur la situation du corps enseignant au niveau de l'enseignement primaire et secondaire tant du point de vue quantitatif que qualitatif, dans les années récentes et dans le futur, le Comité a décidé d'entreprendre une étude de synthèse reposant sur des données de base recueillies dans un certain nombre de pays Membres de l'OCDE et consignées dans des monographies nationales. Six volumes contenant ces monographies ont déjà été publiés.

De plus, pour les pays Membres n'ayant pas fait l'objet d'une monographie nationale, le Secrétariat a préparé un certain nombre de statistiques de base concernant le personnel enseignant, complétées par une note liminaire décrivant la formation des enseignants, qui font l'objet du présent volume. Ces données ont été vérifiées et complétées par les services intéressés des pays Membres. A ces informations, les autorités norvégiennes ont joint une contribution spécifique sous la forme d'une étude de cas d'application des modèles de demande et d'offre d'enseignants.

Les services nationaux ayant vérifié et complété les données, sont les suivants :

Canada	Department of Manpower and Immigration.
Espagne	Sous-direction générale de la Recherche et de la Coopération scientifique - Ministère de l'Education et de la Science.
Etats-Unis	Office of Program Planning and Evaluation. Office of Education - Department of Health, Education and Welfare.
Islande	Economic Institute.
Japon	Research Section. Minister's Secretariat. Ministry of Education.
Norvège	Ministère de la Recherche et de la Planification. Ministère royal de l'Education et des Affaires ecclésiastiques.
Turquie	Département de la Planification sociale. Commissariat au Plan.

PREFACE

The programmes of the OECD Committee for Scientific and Technical Personnel have given considerable attention to the problems connected with the demand for and supply of teachers as a vital element in the quantitative and qualitative development of the educational system. The quest for an equilibrium between supply and demand calls for the implementation of specific training, recruitment and utilisation policies in what is one of the most important sectors of highly qualified manpower.

Questions concerning the demand for and supply of teachers arose in several studies carried out by the OECD particularly in connection with (a) general studies on scientific and technical personnel in OECD countries, (b) general policy and planning in the field of education in Member countries, (c) the recruitment and training of mathematics and science teachers.

In order to take stock of the current and future teacher situation in primary and secondary education, both from a quantitative and qualitative point of view, the Committee requested the Secretariat to prepare a general policy report on this question which would be based on the experience and data put together for a number of OECD countries in the form of individual country case-studies. Six volumes, containing case-studies, have already been published.

In this additional volume, the Secretariat presents short papers including statistical data and a note on the teacher training process for the Member countries which were not the object of a national case-study. These data have been checked and completed by the services concerned in each country. The Norwegian Authorities have added to the statistical data a case-study in the application of teacher demand and supply models for their country.

The National Authorities who have checked and completed the data are as follows:

Canada	Department of Manpower and Immigration.
Iceland	Economic Institute.
Japan	Research Section. Minister's Secretariat. Ministry of Education.
Norway	Research and Planning Department. Royal Ministry of Education and Ecclesiastical Affairs.
Spain	Dirección General de Promoción y Cooperación científica - Ministerio de Educación y Ciencia.
Turkey	The State Planning Organisation, Department for Social Planning.
United States	Office of Program Planning and Evaluation. Office of Education - Department of Health, Education and Welfare.

TABLE DES MATIERES - TABLE OF CONTENTS

Page

Canada 9
Espagne 19
Iceland 37
Japan 49
Norway 63
Turquie 117
United States 135

C A N A D A

NOTE ON TEACHER TRAINING

Each of the ten provinces of Canada has its own requirements for teacher certification and as a result teacher education programmes have developed in accordance with these requirements.

In 1967-68, teacher training was provided in 99 institutions - 69 teachers' colleges for the training of elementary teachers, and 30 university faculties of education for the training of secondary or elementary and secondary teachers depending on the province. Teachers' colleges exist in four provinces only (Nova Scotia, New Brunswick, Quebec and Ontario) and account for over 50 per cent of the full-time enrolment. In the remaining six provinces, all teacher-training, for both elementary and secondary teachers, is given in university faculties or colleges of education.

In provinces where all teacher training is offered in the universities, it is possible to identify at least three distinct programmes leading to degrees or diplomas in education. These are (a) the four- or five-year programmes leading to the degree of B.Ed. or its equivalent and combining academic and professional studies. This is by far the most common programme. (b) the one- or two-year post-bachelor's degree programme leading to diplomas in education or the B.Ed. degree, and (c) the one- or two-year non-degree programme beyond high school graduation and leading to provincial certification for teaching at the elementary level.

In addition to these, programmes of varying length are offered by the universities for the training of specialist teachers, particularly for teachers of vocational subjects, physical education, music, etc.

Teachers' colleges normally offer one-year courses beyond high school graduation at the senior matriculation level and two-year courses beyond junior matriculation, both leading to the same level of certification. In some cases, credit for these courses can be transferred to a university if the student wishes to pursue a degree programme in education. In the teachers' colleges (écoles normales) of Quebec there is a four-year course offered leading to a bachelor's degree and teaching certificate (Brevet A).

STATISTICAL DATA

List of Tables

TABLE 1 Number of Teachers Classified by Administrative Control of the School and by Sex - Historical and Projected (1950-1975)

TABLE 2 Number of Pupils in the Elementary Grades Classified by Administrative Control of the School - Historical and Projected (1951-1975)

TABLE 3 Number of Pupils in the Secondary Grades Classified by Administrative Control of the School - Historical and Projected (1951-1975)

TABLE 4 Number of Pupils in Elementary and Secondary Grades Classified by Administrative Control of the School - Historical and Projected (1951-1975)

Table 1

Number of Teachers Classified by Administrative Control of the School and by Sex, Historical and Projected (1950-1975)

Year	Sex	Administrative Control			Total
		Public	Federal	Private	
1950-51	Total	89,682	..	2,519	..
	Female	65,618	..	1,723	..
1955-56	Total	115,711	1,094	2,887	119,692
	Female	84,707	722	2,008	87,437
1960-61	Total	151,179	1,902	8,743	161,824
	Female	107,258	1,268	5,499	114,025
1965-66	Total	200,988	2,138	12,475	210,102
	Female	132,085	1,329	7,138	136,227
1970-71(1)	Total	233,510	..	..	-
1975-76(1)	Total	244,443	..	..	-

(1) W.J. Brown, "Projections of Enrolment and Teacher Demand in Canada to 1977-78", Canadian Teachers' Federation, Ottawa, December 1967, p.34.

.. Data not available.

Source: Dominion Bureau of Statistics.

Table 2

Number of Pupils in the Elementary Grades(1) Classified by Administrative Control of the School, Historical and Projected (1951-1975)

Year	Level	Administrative Control				Population 5-13 Age-Group	
		Public	Federal	Private	Total		
1951-52	Elementary	2,132,100	24,300	73,900	2,230,300	1951(2)	2,313,549
	of which kindergarten is	80,600	-	2,900	83,500		
1955-56	Elementary	2,657,500	31,300	95,200	2,784,000	1955(3)	2,849,800
	of which kindergarten is	97,600	100	5,100	102,800		
1960-61	Elementary	3,274,100	42,400	95,700	3,412,200	1960(3)	3,484,600
	of which kindergarten is	134,000	4,500	7,100	145,600		
1965-66	Elementary	3,768,200	43,300	110,800	3,922,300	1965(3)	3,904,800
	of which kindergarten is	210,300	4,700	12,000	227,000		
1970-71(4)	Elementary	..	..	..	4,167,000		..
	of which kindergarten is	..	..	..	276,000		
1975-76(4)	Elementary	..	..	..	4,005,000		..
	of which kindergarten is	..	..	..	322,000		

(1) For statistical purposes defined as kindergarten to Grade VIII plus junior auxiliary classes.

(2) Actual from 1951 Census of Canada.

(3) D.B.S. estimates (unpublished).

(4) W.M. Illing and Z.E. Zsigmond, "Enrolment in Schools and Universities 1951-52 to 1975-76", Staff Study No. 20, prepared for the Economic Council of Canada.

.. Data not available.

Source: Dominion Bureau of Statistics.

Table 3

Number of Pupils in the Secondary Grades(1) Classified by Administrative Control of the School, Historical and Projected (1951-1975)

Year	Administrative Control				Population	
	Public	Federal	Private	Total	14-17 Age-group	
1951-1952	349,800	500	44,200	394,500	1951(2)	849,912
1955-1956	457,300	800	49,300	507,400	1955(3)	944,900
1960-1961	714,900	1,800	72,400	789,100	1960(3)	1,187,200
1965-1966	1,118,300	2,800	84,300	1,205,400	1965(3)	1,500,300
1970-1971(4)	..	..	..	1,462,000		..
1975-1976(4)	..	..	..	1,671,000		..

(1) For statistical purposes defined as Grades IX to XI, XII or XIII according to provincial organisation, plus ungraded secondary programmes.

(2))
(3)) See Table No. 2.
(4))

.. Data not available

Source: Dominion Bureau of Statistics.

Table 4

Number of Pupils in Elementary and Secondary Grades(1) Classified by Administrative Control of the School, Historical and Projected (1951-1975)

Year	Administrative Control				Population 5-17 Age-group	
	Public	Federal	Private	Total		
1951-1952	2,481,900	24,800	118,100	2,624,800	1951(2)	3,163,461
1955-1956	3,114,800	32,100	144,500	3,291,400	1955(3)	3,794,700
1960-1961	3,989,000	44,200	168,100	4,201,300	1960(3)	4,671,800
1965-1966	4,886,500	46,100	195,100	5,127,700	1965(3)	5,405,100
1970-1971(4)	..	..	..	5,629,000		..
1975-1976(4)	..	..	..	5,676,000		..

(1) See Tables 2 and 3.

(2))
(3)) See Table 2.
(4))

.. Data not available.

Source: Dominion Bureau of Statistics.

ESPAGNE

NOTE SUR LA FORMATION DES ENSEIGNANTS

A. Formation des enseignants de l'enseignement primaire

Jusqu'à une loi récente, qui devait entrer en application à partir de l'année scolaire 1967-68, les écoles normales d'instituteurs recrutaient les élèves-maîtres âgés au moins de 14 ans et titulaires du baccalauréat élémentaire général ou technique (4 ou 5 ans après les 4 ans d'école primaire). Les études duraient 3 années à l'issue desquelles, les élèves-maîtres passaient un examen conférant le diplôme de maître de l'enseignement primaire. Pour enseigner comme titulaire dans une école primaire publique, il fallait passer un concours de recrutement organisé annuellement dans chaque province. Le diplôme de maître de l'enseignement primaire ne permettait pas d'accéder à l'enseignement supérieur, sauf à la section de pédagogie de la faculté de philosophie.

Une loi a récemment modifié les conditions d'entrée dans les écoles normales d'instituteurs et la durée de leurs études. Les élèves-maîtres devront être désormais titulaires du baccalauréat supérieur, ou avoir fait 6 ans d'études secondaires après les 4 années d'enseignement primaire.

La loi sur l'enseignement primaire, texte refondu par Décret du 2 novembre 1967, a modifié les conditions d'entrée dans les écoles normales et la durée des études. Le nouveau plan d'études a été approuvé par le Décret ministériel du ler juin 1967. La durée des études sera de deux années ; à la fin de la 2ème année, les élèves passeront une épreuve de maturité ; les élèves qui réussiront cette épreuve devront suivre un stage de pratique pédagogique de 8 mois, stage pour lequel ils recevront une rémunération équivalente à 90 pour cent du traitement de base initial des instituteurs.

Le stage pédagogique pratique s'effectue sous le contrôle des professeurs des Ecoles normales et des Inspecteurs de l'Enseignement primaire qui évalueront le travail de l'élève-maître. Le titre de "maître" est délivré quand les résultats du stage pratique et des deux années de cours suivis à l'Ecole normale sont satisfaisants. Les élèves les plus brillants, tant à l'Ecole normale qu'au stage pratique, seront intégrés directement dans le "Corps des maîtres nationaux", comme titulaires, sans avoir à passer le concours de recrutement (dans ce corps). Par contre, pour les diplômés moins bien classés, ce concours de recrutement sera exigé pour intégrer le "Corps des maîtres nationaux".

Par conséquent, compte tenu de la modification de la loi sur l'enseignement primaire, il existe maintenant deux systèmes pour être titulaire d'un poste d'enseignant dans l'enseignement primaire officiel :

(a) par nomination directe, sans concours pour les élèves les plus brillants pendant les études à l'Ecole normale et le stage pratique ;

(b) par concours de recrutement, qui tiendra compte de la préparation théorique et de l'expérience pratique du maître.

Chaque année, on fixera la proportion de places vacantes dans le "Corps des maîtres nationaux" qui auront à être couvertes par l'un et l'autre système de recrutement.

Les maîtres diplômés de l'enseignement normal primaire (nouveau régime) sont dispensés du cours pré-universitaire et de l'examen le sanctionnant, qui permet d'accéder aux centres d'enseignement supérieur universitaire, tant en sciences qu'en lettres. Les diplômés de l'ancien régime entrent directement dans la faculté des lettres (section de pédagogie) et sont dispensés du cours pré-universitaire et de l'examen qui le conclut ; par contre, ils y sont tenus pour accéder aux autres facultés et écoles techniques supérieures.

Les spécialisations existantes au sein du corps enseignant de l'enseignement primaire sont les suivantes :

1. Enseignants spécialisés pour donner des cours dans les 7ème et 8ème années de l'enseignement primaire ; les élèves fréquentant ces cours ont accès à la 3ème année du premier cycle de l'enseignement secondaire et au cours de formation professionnelle industrielle.

2. Enseignants des classes spéciales (déficients physiques et mentaux).

18

3. Enseignants spécialisés dans l'enseignement pré-primaire : classes maternelles (2 et 3 ans) et classes enfantines (4 et 5 ans).

4. Directeurs d'écoles officielles à plusieurs classes (minimum de 8 classes pour garçons et pour filles).

Les diplômes afférents à ces spécialisations sont délivrés après un cours de formation à l'Ecole normale ou dans des institutions spécialisées. Le nombre de maîtres qui se sont spécialisés pour enseigner dans les 7ème et 8ème années de l'enseignement primaire en 1966-67, ainsi que ceux qui suivent cette formation en 1967-68, est indiqué dans le tableau A. Le nombre de cours et de maîtres destinés à l'enseignement spécial figure dans le tableau B.

Tableau A

Nombre de maîtres qui ont suivi ou suivent la spécialisation en sciences ou en lettres (7ème et 8ème années)

Périodes des cours de formation	Nombre de diplômés		
	Sciences	Lettres	Total
Cours A(1) (16 janv. au 16 nov. 67)	24	323	347
" A(1) (1er oct. au 4 nov. 67)	14	79	93
" B (1er oct. au 20 déc. 67)	47	212	259
" C (8 janv. au 6 avril 68)	468	278	746
" D (8 janv. au 31 mai 68)	447	452	899
" E (1er oct.67 au 31 mai 68)	765	791	1.556
Total	1.765	2.135	3.900

(1) Licenciés en sciences et lettres.

Source : Direction générale de l'Enseignement primaire.

Tableau B

Nombre de maîtres ayant suivi les cours de formation pour l'enseignement spécial (1962-1968)

Année	Nombre de cours	Nombre de diplômés	Chiffres cumulés
1961-62	2	355	355
1962-63	1	22	377
1963-64	3	142	519
1964-65	5	306	825
1965-66	9	406	1.231
1966-67	10	402	1.633
1967-68	11	406	2.039

Source : voir source sous tableau A.

B. Formation des enseignants de l'enseignement secondaire

(a) Enseignement secondaire général

Pour enseigner dans l'enseignement secondaire, il faut être titulaire, soit d'une licence universitaire, soit d'un diplôme d'une école supérieure (dessin, autres enseignements spéciaux). Les études universitaires durent en général 5 années.

La formation pédagogique des futurs enseignants se déroule en deux phases au sein de l'"école de formation du professorat de l'enseignement secondaire". La première période coïncide avec les deux dernières années de formation universitaire. La formation pédagogique reçue est à prédominance théorique, avec quelques stages dans des écoles secondaires spécialement désignées à cet effet. La 2ème partie de la formation a lieu dans les "instituts officiels de l'enseignement secondaire" pour les titulaires de la licence. Cette formation pédagogique est surtout pratique. Elle se déroule sous la direction d'un professeur conseiller. La formation pratique est complétée par des leçons de méthodologie et de didactique données dans des "séminaires didactiques" rattachés aux instituts. L'élève-professeur pendant ces deux années donne des leçons dans des classes de l'enseignement secondaire. Si sa formation pédagogique s'est déroulée de façon satisfaisante, l'"école de formation au professorat de l'enseignement secondaire" délivre au candidat un certificat d'aptitude pédagogique.

Il existe plusieurs catégories d'enseignants :

- les professeurs titulaires recrutés par concours,
- les professeurs des matières spéciales recrutés par concours ou directement par l'autorité compétente,
- les professeurs-adjoints recrutés par concours, qui devront être licenciés et qui secondent les professeurs titulaires dans leurs tâches,
- les maîtres-assistants, diplômés de l'Université, recrutés sur titres par les autorités compétentes et qui remplissent les fonctions d'assistant pour les exercices pratiques.

(b) Enseignement secondaire technique et professionnel

Dans l'enseignement technique (préparation au baccalauréat technique), les professeurs des matières générales reçoivent la même formation que celle des professeurs de l'enseignement secondaire général. Les professeurs des matières spéciales sont diplômés des facultés ou d'une école technique supérieure. Les chefs d'atelier sont des diplômés des écoles de "maîtrise" ou des titulaires du baccalauréat supérieur ayant reçu une formation spécialisée au sein de l'Institut de formation au professorat de l'enseignement professionnel du second degré. Cet institut, qui donnait également des cours de formation à des professeurs intérimaires (déjà en exercice), a été absorbé par l'école de formation au professorat de l'enseignement secondaire à la suite des réformes de structure ayant créé un baccalauréat élémentaire unique (études de 4 années après 4 ans d'enseignement primaire).

Dans l'enseignement professionnel industriel (apprentissage : 3 années puis, éventuellement, "maîtrise industrielle" : 2 années), les professeurs titulaires et les maîtres d'atelier sont recrutés par concours et examen d'aptitude.

Pour la période pré-apprentissage, il suffit d'avoir le titre de "maître national" et d'avoir suivi les cours de spécialisation. Pour la période d'apprentissage, l'enseignant doit au moins posséder le titre d'expert (technicien supérieur). Un titre d'enseignement supérieur est nécessaire pour enseigner au niveau des écoles de maîtrise industrielle.

Les professeurs d'enseignement commercial sont formés pendant 3 années dans un second cycle des écoles de commerce. Ces dernières délivrent au niveau secondaire, après 3 ans d'études faisant suite au baccalauréat élémentaire, le diplôme d'expert commercial. Ce diplôme permet de poursuivre les cours de formation d'enseignants des matières commerciales de niveau supérieur non-universitaire.

DONNEES STATISTIQUES

Liste des tableaux

TABLEAU 1a Nombre d'enseignants dans l'enseignement primaire (public et privé) par sexe, 1950-1975.

TABLEAU 1b Nombre d'enseignants dans les établissements publics de l'enseignement primaire, par sexe, 1950-1975.

TABLEAU 2 Nombre d'élèves dans l'enseignement primaire (public et privé), 1950-1975.

TABLEAU 3 Nombre d'élèves-maîtres par sexe dans l'enseignement normal primaire (public et privé), 1950-1975.

TABLEAU 4 Nombre d'enseignants dans l'enseignement secondaire général public et privé par qualification et par sexe, 1950-1975.

TABLEAU 5 Nombre d'élèves dans l'enseignement secondaire général (public et privé), 1950-1975.

TABLEAU 6 Nombre d'enseignants dans l'enseignement secondaire technique et professionnel public et privé, par sexe, 1950-1975.

TABLEAU 7 Nombre d'élèves dans l'enseignement technique et professionnel (public et privé), 1950-1975.

TABLEAU 8 Nombre d'élèves-maîtres par sexe dans l'enseignement normal technique, 1955-1965.

Tableau 1a

Nombre d'enseignants dans l'enseignement primaire (public et privé) par sexe - 1950-1975

	1950-51		1955-56		1959-60		1965-66		1970-71		1974-75	
	MF	F	MF	F	MF	F	MF	F	MF	F	MF	F
I. PRIMAIRE	76.398	46.197	83.940	51.031	86.112	50.095	98.024	59.783	120.423	73.500	115.000	72.450
II. PRE-PRIMAIRE	3.528(1)	2.913(1)	4.589(1)	4.472(1)	13.336	11.760(2)	15.491	12.226(2)	18.251	16.640	26.326	22.240
III. PRE-PRIMAIRE ET PRIMAIRE ..	79.926	49.110	88.529	55.503	99.448	61.855	113.515	72.009	138.674	90.140	141.326	94.690

(1) Enseignement pré-primaire public uniquement.

(2) Le nombre des enseignantes dans le pré-primaire a été estimé en se basant sur le nombre des écoles maternelles et des écoles mixtes ou destinées aux enfants de sexe féminin, âgés de 4 ou 5 ans, dont les postes d'enseignant sont normalement occupés par des femmes.

Sources: Institut national de la Statistique, "Estadisticas de la Enseñanza en España" (1950-51 et 1955-56) et "Estadisticas de la Enseñanza Primaria en España" (1959-60 ; 1965-66). - Travaux de la Commission de l'Enseignement pour le Commissariat du Plan de Développement à l'occasion de la préparation du IIème Plan de Développement économique 67-71. - Rapport PRM - ESPAGNE (OCDE), Madrid, 1963. - La ventilation par sexe a été faite en extrapolant les tendances passées.

Tableau 1b

Nombre d'enseignants dans les établissements publics de l'enseignement primaire, par sexe, 1950-1975

	1950-51		1955-56		1959-60		1965-66		1966-67	
	MF	F	MF	F	MF	F	MF	F	MF	F
I - PRIMAIRE	56.389	31.199	61.597	34.366	70.663	39.062	77.410	42.980	81.265	45.280
1.1. Titulaires d'un diplôme d'école normale ...	56.389	31.199	61.597	34.366	70.663	39.062	77.272	42.916	81.265	45.280
- Spécialistes en sciences ou lettres pour les 7ème et 8ème classes	...	...	...	...	...	...	2.500	...	2.847	...
- Spécialistes en pédagogie - thérapeutique	...	...	...	...	...	...	825	...	1.230	...
- Directeurs d'écoles primaires	...	...	553	249	...	...	1.451	470	1.877	...
1.2. Autres	-	-	-	-	-	-	138	64	-	-
II - PRE-PRIMAIRE ET PRIMAIRE	59.917	34.112	66.186	38.838	78.082	46.481	84.280	49.850	88.185	52.200

Sources: Institut national de la Statistique. "Estadisticas de la Enseñanza en España" (1950-51 ; 1955-56 ; 1959-60 et 1965-66) ; pour 1966-67 données fournies par le Secrétariat général de l'Enseignement primaire. Ministère de l'Education et de la Science.

Tableau 2

Nombre d'élèves dans l'enseignement primaire (1) (public et privé) 1950-75

ANNEES	Population scolaire	Population d'âge correspondant (6-11)	
		Chiffres absolus	Taux de scolarisation
1950-51	2.667.548	2.778.762	60,1(3)
1955-56	2.745.926	3.149.219	68,9(3)
1959-60	3.224.425	3.200.163	84,5(3)
1965-66	3.331.566	3.452.696	85,7(4)
1970-71	3.305.226(2)	3.542.986	99,0(5)
1974-75	3.359.140(2)	3.801.426	99,0(5)

(1) Pour la population scolaire, nous n'avons inclus que les élèves âgés de plus de 6 ans. Les élèves de l'enseignement pré-primaire ont été exclus, soit : 125.243 en 1950-51, 418.920 en 1955-56, 527.044 en 1959-60 et 610.627 en 1965-66.

(2) Hypothèses retenues par les Groupes d'étude de l'enseignement primaire et secondaire de la Commission de l'Enseignement du Plan, pour 1967-71 ; les enfants de 6 à 10 ans correspondent à l'enseignement primaire, les enfants de 10 à 13 ans seront scolarisés à raison de 40 pour cent dans l'enseignement primaire et le reste dans l'enseignement secondaire.

(3) D'après le rapport PRM-Espagne.

(4) D'après le rapport de la Commission de l'Enseignement du Plan 1967-71 (Groupe d'étude sur l'enseignement primaire).

(5) Groupe d'âge 6-10.

Sources : UNESCO, l'Education dans le Monde, tome II ; Institut national de la Statistique, "Estadistica de la Enseñanza en España" (1950-51, 1955-56, 1959-60, 1965-66) ; Rapport du Groupe d'étude sur l'Enseignement primaire de la Commission de l'Enseignement du Plan de Développement 1967-71 ; Rapport PRM-Espagne (OCDE, 1965) et "Secretaria General Técnica" du Ministère de l'Education et de la Science : "Datos y cifras de la enseñanza en España", 1966.

Tableau 3

Nombre d'élèves-maîtres par sexe dans l'enseignement normal primaire (public et privé) 1950-75

	1950-51		1955-56		1960-61		1965-66		1970-71		1974-75	
	MF	F	MF	F	MF	F	MF	F	MF	F	MF	F
Nouveaux entrants (1)	7.730	5.730	10.305	6.206	13.240	8.008	18.698	9.174	9.400(2)	...	9.400(2)	...
Inscrits	21.086	15.477	28.551	18.104	43.126	26.885	63.116	38.331	33.600(2)	21.170(3)	35.500(2)	22.365(3)
Diplômés	4.119	3.055	5.414	3.969	8.771	5.695	10.282	7.217	7.600(2)	5.170(4)	7.500(2)	5.100(4)

(1) Inscrits en première année pour la première fois.

(2) D'après le Rapport PRM-ESPAGNE, OCDE, 1965.

(3) Estimation (d'après les tendances historiques des dix dernières années, les élèves de sexe féminin représentent 63 pour cent environ du total des inscrits).

(4) Estimation (d'après l'évolution historique, les élèves de sexe féminin représentent environ 68 pour cent des diplômés).

Sources : Institut national de la Statistique, "Estadisticas de la Enseñanza en España", années : 1950-51, 1955-56 et 1964-65. "Anuario estadistico de España". 1967 ; Rapport PRM-Espagne, OCDE, 1965.

Tableau 4

Nombre d'enseignants dans l'enseignement secondaire général public et privé par qualification et par sexe 1950-1975

	1950-51		1955-56		1960-61		1965-66		1970-71		1974-75	
	MF	F	MF	F	MF	F	MF	F	MF	F	MF	F
Enseignement public												
Professeurs titulaires, adjoints, chargés de cours et auxiliaires	2.345	-	2.636	845	3.934(3)	1.519						
Autres professeurs (1)	1.008	-	1.339	647	1.170	654						
Total	3.353	1.002	3.975	1.492	5.104	2.173						
Enseignement privé												
Professeurs "licenciados" (2)	6.469	-	7.664	2.897	8.932	3.700						
Autres professeurs	6.596	-	7.164	2.737	7.587	2.752						
Total	13.065	4.531	14.828	5.634	16.519	6.452						
Total général	16.418(5)	5.533(5)	18.803	7.126	21.623	8.625	28.559(5)	-	34.994(4)	-	42.846(4)	-

(1) Dans le rapport PRM, la catégorie "autres professeurs" est considérée comme "non-diplômés" (des universités) ; dans cette catégorie, il y a des professeurs des matières spéciales (religion, éducation physique, etc.) ; d'après ce même rapport, les professeurs non-diplômés (y compris ceux des écoles de commerce) représenteraient 39 pour cent du total des professeurs en 1961, 40 pour cent en 1971 et 26 pour cent en 1975.

(2) "Licenciados" possédant un titre universitaire.

(3) Soit : professeurs titulaires : 1.007, professeurs-adjoints et chargés de cours : 2.386, auxiliaires : 541.

(4) A charge complète uniquement, ce qui ne veut pas dire que des professeurs à temps partiel ne seraient pas employés. Source : les besoins de diplômés en Espagne au cours de la période 1964-71. Rapport PRM-Espagne, OCDE, 1965.

(5) Non compris les écoles privées "non affiliées" (centres libres).

Sources: Pour MF 1950-51 ; 1955-56 et 1960-61 : Rapport PRM, tableau 23.

Tableau 5

Nombre d'élèves dans l'enseignement secondaire général (public et privé) 1950-1975

Années	Population scolaire	Population d'âge correspondant (11-17)
1950-51	221.809 (a)	3.415.153
1955-56	328.010 (b)	3.286.125
1960-61	474.057 (b)	3.726.308 (b)
1965-66	834.290 (c)	3.740.650
1970-71	1.224.800 (b)	3.965.917
1974-75	1.499.600 (b)	4.121.700

Sources: (a) UNESCO : l'éducation dans le monde, tome I.

(b) Les besoins de diplômés en Espagne au cours de la période 1964-71. Rapport PRM-Espagne, OCDE, 1965.

(c) Le mouvement éducatif en Espagne 1966-67 (UNESCO-BIE).

Tableau 6

Nombre d'enseignants dans l'enseignement secondaire technique et professionnel public et privé par sexe - 1950-1975

	1950-51		1955-56		1960-61		1965-66		1970-71		1974-75	
	MF	F	MF	F	MF	F	MF	F	MF	F	MF	F
Baccalauréat technique												
Professeurs titulaires adjoints, etc.	156		864	207	2.012	852						
Autres professeurs	96		343	31	1.128	368						
Total	252		1.207	238	3.140b)	1.220	5.313c)		3.260b)(1)	-	4.533b)(1)	
Ecoles de commerce (a)												
Professeurs titulaires adjoints, etc.	718	36	1.168	204	1.086	210						
Autres professeurs	119	33	213	105	392	105						
Total	837	69	1.381	309	1.478	315	914c)	-	680b)(1)		726b)(1)	
Formation professionnelle												
Industrielle	-	-	1.567	87	8.698(2)		9.935					
Maritime	-	-	53	-	55		265					
Total	-	-	-	-	-			-	5.350d)	-	8.827d)	

(1) Voir note (4) tableau 4.

(2) Estimation.

Sources: Annuaire statistique de l'enseignement espagnol ; le chiffre de 1960 est celui de l'année 1959-60 ; pour les années 1965-66, 1970-71 et 1974-75, on ne sait si la distinction entre le cycle de niveau secondaire et le cycle plus élevé formant les professeurs d'enseignement commercial est faite ; il faudrait pouvoir séparer ces deux cycles tant pour les professeurs que pour les élèves (tableau 7). Voir source sous tableau 5 pour b) et c) ; d) cf. Rapport PRM-Espagne.

Tableau 7

Nombre d'élèves dans l'enseignement technique et professionnel (public et privé) 1950-1975

Années	Population scolaire(1)				Population d'âge correspondant(2) (14-17)
	Baccalauréat technique	Ecoles de commerce	Formation professionnelle	Total	
1950-51	720(a)	51.674(a)	19.308(a)(2)	71.702	2.173.596
1955-56	9.706(b)	51.216(b)	26.490(2)	87.412	1.704.982
1960-61	23.378(b)	21.668(b)	84.016(d)	129.062	2.021.800(d)
1965-66	48.453(c)	19.950(c)	125.080(c)	193.483	2.127.809
1970-71	97.800(b)	23.800(b)	160.500(d)	282.100	2.170.569
1974-75	136.000(b)	25.400(b)	264.800(d)	426.200	2.376.600(d)

(1) N'ont pas été retenus les enseignements suivants : les écoles techniques moyennes, les écoles de formation d'auxiliaires de la médecine. La formation des professeurs d'enseignement commercial - 2ème cycle de niveau supérieur universitaire des écoles de commerce, devrait être éliminée, mais on ne peut désagréger le chiffre des enseignants correspondant. Les enseignants dont le nombre est donné au tableau 6 doivent enseigner aux deux niveaux. Le chiffre des élèves de niveau secondaire est donc égal au chiffre donné dans ce tableau moins le chiffre des inscrits du cycle supérieur des écoles de commerce, donné dans le tableau 8.

(2) Ces chiffres ne semblent intéresser que les Centres d'Etat.

Sources: (a) A. Tena Artigas : l'Education dans le plan de développement (Edition Gredos S.A., Madrid) ; voir source (b) et (c) sous tableau 5 ; (d) : Rapport PRM-Espagne.

Tableau 8

Nombre d'élèves-maîtres par sexe dans l'enseignement normal technique 1955-1965

	1950		1955-56		1960-61		1965-66	
	MF	F	MF	F	MF	F	MF	F
1. Cycle supérieur des écoles de commerce (1)								
Nouveaux entrants	3.569	511	2.822	377	2.058	158	1.753(2)	156(2)
Inscrits	8.876	1.227	8.090	818	6.638	524	5.606(2)	506(2)
Diplômés	2.161	272	1.818	202	797	111	640(2)	65(2)
2. Institut de formation du professorat de l'enseignement professionnel								
Nouveaux entrants			353		239		167	
Inscrits			353		239		167	
Diplômés			353		239		167	

(1) Formant les professeurs de commerce.

(2) 1964-65.

ICELAND

NOTE ON TEACHER TRAINING

The training of teachers for the primary and lower secondary levels is given in the Teacher Training College of Iceland. A re-organisation of the different divisions of this establishment was done in April 1963.

The general teacher training division recruits student-teachers with the intermediate secondary school diploma (with certain minimum pass marks). The training course which ends with the general teachers' certificate lasts 4 years and qualifies teachers to teach in primary and lower secondary schools (compulsory period of schooling includes 6 years of primary school and 2 years of lower secondary school).

The teacher training division for holders of university entrance diplomas offers a one-year training course ending with the general teachers' certificate qualifying them as teachers in primary and lower secondary schools.

The academic division created by the Act of April 1963, recruits holders of the general teachers' certificate; they take a one-year course, successful completion of which grants them the right to enter a university.

An advanced division may be created with the aim of offering to holders of the teachers' certificate, a two-year course in advanced primary and secondary school teaching. The trainee will specialise in 3 subjects one of which must be studied in depth, thus offering a certain level of specialisation.

The preparatory division for specialised study offers a two-year course preparing students for teacher training in handicrafts, physical education, music, art, domestic science and other practical educational fields.

The handicraft division offers a two-year course for those wishing to qualify as teachers of handicrafts. Students are provided with both practical and theoretical instruction in teaching these subjects.

Teachers in upper secondary schools (gymnasium) must have a university diploma.

A degree called the "baccalaureus artium" (B.A.) offers an optional grouping of subjects during a three-year course, the principal aim of which is the training of teachers of the lower secondary schools (the lower secondary schools offer a four-year course of which 2 years are compulsory).

There are other schools for training specialised teachers:

Training college for teachers for domestic science trains teachers for domestic science colleges and secondary schools - a two-year course.

Teachers in drawing, teachers of music and singing receive their training at the School of Arts and Crafts and the Reykjavik College of Music respectively. If students have not already completed the teachers' training college they have to attend it for courses in education, psychology, teaching methods, hygiene, etc.

STATISTICAL DATA

List of Tables

TABLE 1 Number of full-time teachers employed in primary education, by qualifications, by sex from 1950 to 1975.

TABLE 2 Enrolments and population of corresponding age in primary education from 1950 to 1975.

TABLE 3 Number of new entrants, enrolments and graduates of primary teacher training by type of training received from 1950 to 1975.

TABLE 4 Number of full-time teachers employed in general secondary education from 1950 to 1975.

TABLE 5 Enrolments and population of corresponding age in general secondary education from 1950 to 1975.

TABLE 6 Number of new entrants and graduates of specialised teacher training (non-university level) from 1950 to 1975.

Table 1

Number of full-time teachers employed in primary education(1), by qualifications, by sex from 1950 to 1975

	1950-51		1955-56		1960-61		1965-66		1970-71		1975-76	
	MF	F	MF	F	MF	F	MF	F	MF	F	MF	F
Qualified teachers	-	-	-	-	-	-	790	338	-	-	-	-
Non-qualified teachers	-	-	-	-	-	-	134	42	-	-	-	-
TOTAL	558(2)	150(2)	645(3)	-	804	282	924	380	990	-	990	-

(1) Grades 1-6 (age-groups 7-12).

(2) In these UNESCO data teachers in junior secondary schools and part of the teachers in middle schools are included with those of the primary schools to which they are attached.

(3) Excluding auxiliary teachers (162); the numbers of teachers (645) refers to "permanent" teachers (source: International Yearbook of Education, International Bureau of Education).

Table 2

Enrolments(1) and population of corresponding age in primary education from 1950 to 1975

	Enrolments	Population of corresponding age (7-13)
1950-51	15,074	15,020
1955-56	19,000	-
1960-61	23,281	25,500
1965-66	25,370	26,237
1970-71	27,228	27,719
1975-76	27,324	27,810

(1) The number of pupils enrolled corresponds to the data on teachers given in Table 1.

Table 3

Number of new entrants, enrolments and graduates of primary(1) teacher training by type of training received from 1950 to 1975

	1950-51	1955-56	1960-61	1965-66	1970-71	1975-76
	M F	M F	M F	M F	M F	M F
4-year training						
New entrants	14	16	29	142	176	193
Enrolments	101	79	87	339	397	540
Graduates	32	25	20	49	80	93
1-year training						
New entrants						
Enrolments						
Graduates	14	10	24	35	58	68
Totals						
New entrants	28	26	53	177	234	261
Enrolments	115	84	111	374	455	608
Graduates	46	35	44	84	138	161

Table 4

Number of full-time teachers employed in general secondary education from 1950 to 1975

	1950-51	1955-56	1960-61	1965-66	1970-71	1975-76
	M F	M F	M F	M F	M F	M F
Junior secondary (grade 7-8, age-groups 13-14) Total	-	211	354(2)	415	465	470
Upper secondary (grade 9-13, age-groups 15-19) Total	-	39	80(2)	270	400	440
All general secondary Total	221(1)	250	434(2)	685	865	910

(1) See (2) under Table 1; female teacher: 28 (source: UNESCO: World Survey of Education, Vol. II).

(2) Excluding auxiliary teachers (158 in junior secondary and 28 in upper secondary); the number of teachers refers to "permanent" teachers (source: International Yearbook of Education, International Bureau of Education).

Table 5

Enrolments and population of corresponding age in general secondary education from 1950 to 1975

	Enrolments			Population of corresponding age		
	Lower Secondary (1)	Upper Secondary (2)	Total (3)	13-14	15-19	Total
1950-51	-	-	5,490	-	-	16,878
1955-56	-	-	6,090	-	-	-
1960-61	-	-	10,256	-	-	21,277
1965-66	7,416	6,910	14,326	7,813	18,125	25,938
1970-71	8,560	9,700	18,260	9,027	20,465	29,492
1975-76	8,640	10,710	19,350	9,080	22,882	31,962

(1) Grade 7-8.

(2) Grade 9-13.

(3) Enrolments in part-time vocational education were: 2,915 in 1950-51, 2,642 in 1955-56, 2,480 in 1960-61 and 2,339 in 1965-66 (corresponding age: 15-19); the data of the corresponding group of teachers are not available.

Table 6

Number of new entrants and graduates of specialised teacher training (non-university level) from 1950 to 1975

	1950-51	1955-56	1960-61	1965-66
	M F	M F	M F	M F
Domestic Science Teachers				
New entrants	(1)	(1)	(1)	(1)
Graduates	-	-	-	12
Handicraft Teacher Training				
New entrants	-	-	-	-
Graduates	-	10	12	12

(1) The school takes in approximately 10 to 13 new entrants every year.

JAPAN

4B

NOTE ON TEACHER TRAINING

Teacher training for primary and secondary school teachers is provided at university level in Japan. By establishing national teacher training universities and faculties, the government provides teacher training mainly for primary and lower secondary school teachers together with teachers for kindergartens, special schools and certain subject teachers in upper secondary schools. Since 1963, teacher preparatory universities or faculties have only a four-year course. The previous two-year course was abolished by a plan which took effect in 1953.

In the case of students enrolled in any department other than the teacher training department of higher educational institutions, those who have acquired the credits, approved by the Minister of Education and required by the Educational Personnel Certification Law, can apply for certification. As a result students can earn teacher certificates for secondary and primary schools and kindergartens at almost all four-year institutions. At two-year institutions students can acquire teacher certificates for schools and kindergartens except upper secondary schools. As a matter of fact, almost all primary school teachers and the greater part of lower secondary school teachers are supplied by national teacher training universities. A considerable number of lower secondary school teachers and three-fourths of upper secondary school teachers are produced by departments other than teacher training departments. The majority of kindergarten teachers are trained by junior colleges. Certification requirements vary with the school level. Teachers' certificates for primary schools are for all subjects; those for secondary school are for specified subject areas.

The prospective teachers must follow the university entrance procedures. Practically all higher institutions limit the number of students to be admitted each year. Admission is usually based on the results of the entrance examination given by each institution and the reports from the upper secondary school principal. While the subjects covered in entrance examinations are not uniform, they generally include Japanese, social studies, mathematics, natural science and foreign languages. Some institutions use the results of the tests of the Educational Test Research Institute, along with their own entrance examinations. One of the principal tests taken into consideration is the achievement test to measure candidate's attainment (knowledge, understanding, skill, thinking power, etc.) in national language, social studies, mathematics and science.

Teacher certificates are classified as regular and emergency. Regular certificates qualify for full teaching duties and they are valid in all prefectures and for life. Emergency certificates qualify for assistant teacher post; they are honored for three years only, and only in the prefectures issuing them. Teacher certificates are granted by prefectural boards of education, for public schools. Teacher certificates for private schools are granted by the prefectural governors.

The following chart gives the detail of the prescribed number of credits for each level of education. Regular certificates are subdivided into first- and second-class certificates.

First-class certificate for upper secondary school requires a master's degree. First-class certificate for lower secondary and primary school requires a bachelor's degree.

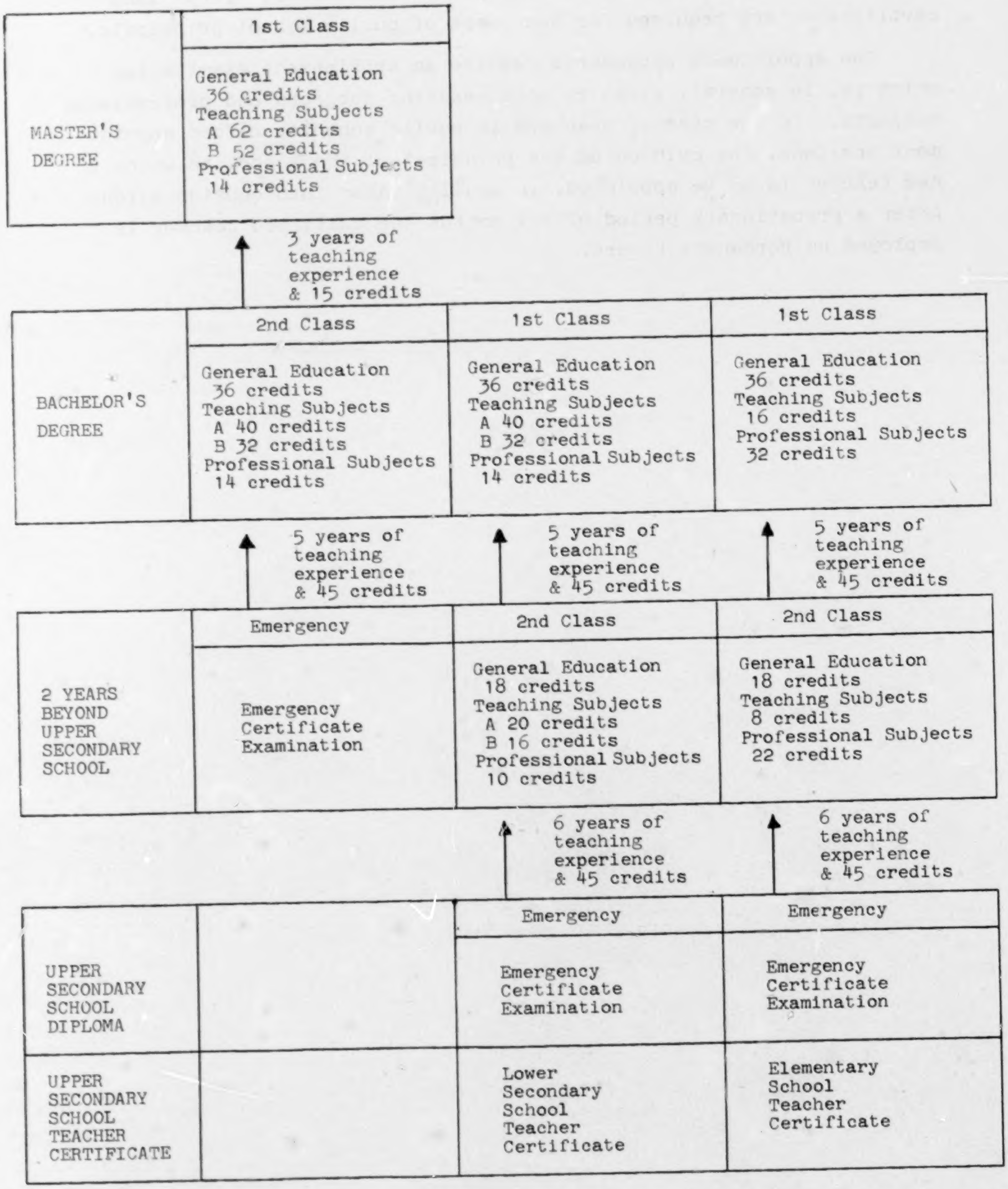
Second-class certificate for upper secondary schools requires a bachelor's degree. Second-class certificates for primary and lower secondary school teachers are granted to junior college graduates or those who have studied at university for two years or more.

The emergency certificatesfor teaching in elementary and lower secondary schools are given to those who have graduated from upper secondary school and have passed educational personnel license examinations conducted under the authorities concerned. On the other hand, emergency certificates for teaching in upper secondary schools are given to those who have graduated from junior colleges. The chart shows that the teachers seeking higher class certificates can earn them by taking additional credits through in-service training courses provided by prefectures or universities and approved by the Minister of Education, or regular courses at university and by serving a prescribed number of years with good records as school teachers.

Although there is no great economic or legal distinction between teachers holding first- and second-class certificates, first-class certificates are required for the posts of public school principals.

The appointment procedures require an appointment examination which is, in general, given in both teaching subjects and professional subjects. In the case of teachers in public schools, before appointment sessions, the opinion of the principal of the school to which a new teacher is to be appointed, is usually taken into consideration. After a probationary period of six months the qualified teacher is employed on permanent tenure.

TYPES OF TEACHER CERTIFICATES AND QUALIFICATIONS



MASTER'S DEGREE	1st Class General Education 36 credits Teaching Subjects A 62 credits B 52 credits Professional Subjects 14 credits		
	↑ 3 years of teaching experience & 15 credits		
BACHELOR'S DEGREE	2nd Class General Education 36 credits Teaching Subjects A 40 credits B 32 credits Professional Subjects 14 credits	1st Class General Education 36 credits Teaching Subjects A 40 credits B 32 credits Professional Subjects 14 credits	1st Class General Education 36 credits Teaching Subjects 16 credits Professional Subjects 32 credits
	↑ 5 years of teaching experience & 45 credits	↑ 5 years of teaching experience & 45 credits	↑ 5 years of teaching experience & 45 credits
2 YEARS BEYOND UPPER SECONDARY SCHOOL	Emergency Emergency Certificate Examination	2nd Class General Education 18 credits Teaching Subjects A 20 credits B 16 credits Professional Subjects 10 credits	2nd Class General Education 18 credits Teaching Subjects 8 credits Professional Subjects 22 credits
		↑ 6 years of teaching experience & 45 credits	↑ 6 years of teaching experience & 45 credits
UPPER SECONDARY SCHOOL DIPLOMA		Emergency Emergency Certificate Examination	Emergency Emergency Certificate Examination
UPPER SECONDARY SCHOOL TEACHER CERTIFICATE		Lower Secondary School Teacher Certificate	Elementary School Teacher Certificate

STATISTICAL DATA

List of Tables

TABLE 1 Number of Teachers in Elementary and Secondary Schools by sex, 1950 to 1965.

TABLE 2 Number of Full-time Teachers by Type of Position, 1956, 1960 and 1965.

TABLE 3 Number of Full-time Teachers by Level of Preparation, 1956 to 1965.

TABLE 4 Percentage Distribution of Full-time Teachers by Age Group, 1965.

TABLE 5 Enrolment in Elementary and Lower Secondary Schools, 1950 to 1965.

TABLE 6 Enrolments in Full-time and Part-time Upper Secondary Schools, 1950 to 1965.

TABLE 7 Full-time Enrolments, Total Enrolments and Graduates in Higher Educational Institutions, 1950 to 1965.

Table 1

Number of Teachers in Elementary and Secondary Schools (Public and Private) by sex, 1950 to 1965

	1950		1955		1960		1965	
	M F	F	M F	F	M F	F	M F	F
ELEMENTARY SCHOOLS								
Full-time teachers	305,520	149,606	340,572	158,239	360,660	163,438	345,117	166,900
Part-time teachers	1,650	373	2,076	1,042	2,029	1,104	2,208	1,018
Total	307,170	149,979	342,648	159,281	362,689	164,542	347,325	167,918
SECONDARY SCHOOLS								
(a) Lower Secondary								
Full-time teachers	182,008	42,794	199,062	45,645	205,988	44,751	237,750	60,216
Part-time teachers	10,489	2,893	9,879	3,469	10,829	4,028	10,463	4,354
Total	192,497	45,687	208,941	49,114	216,817	48,779	248,213	64,570
(b) Upper Secondary								
(full-time courses)								
Full-time teachers			88,811	16,272	109,097	19,511	172,261	30,993
Part-time teachers			10,777	3,330	14,469	4,322	24,569	6,684
Total			99,588	19,602	123,566	23,833	196,830	37,677
(c) Upper Secondary								
(part-time courses)								
Full-time teachers			22,806	3,413	22,622	2,977	21,263	2,373
Part-time teachers			8,044	1,378	7,624	1,639	6,486	1,210
Total			30,850	4,791	30,246	4,616	27,749	3,583
Grand Total Secondary								
Full-time teachers	264,940	58,032	310,679	65,330	337,707	67,239	431,274	93,582
Part-time teachers	28,552	6,669	28,700	8,177	32,922	9,989	41,518	12,248
Grand Total	293,492	64,701	339,379	73,507	370,629	77,228	472,792	105,830

Source: 1950: Annual report of the Ministry of Education, 1950 (in Japanese).
1955, 1960 and 1965: Report on Basic School Statistics, 1955, 1960, 1965.

Table 2

Number of full-time teachers by type of position(1), 1956, 1960 and 1965

	1956(3)		1960		1965	
	Public(2)	Private	Public(2)	Private	Public(2)	Private
Elementary: Total	343,746	1,580	358,696	1,964	343,018	2,100
of which teachers	277,760	1,208	316,717	1,581	303,232	1,662
of which assistant teachers	34,101	171	9,773	143	6,673	150
Lower secondary: Total	194,039	6,759	198,873	7,115	230,454	7,296
of which teachers	170,829	5,662	182,446	6,186	213,717	6,395
of which assistant teachers	8,079	135	2,014	98	1,115	95
Full-time upper secondary: Total	72,056	19,177	79,660	29,437	123,904	48,357
of which teachers	65,727	15,102	74,215	23,938	117,298	38,138
of which assistant teachers	731	676	598	1,147	746	3,222
Part-time upper secondary: Total	21,679	937	21,721	901	20,635	628
of which teachers	19,175	671	20,207	604	19,755	459
of which assistant teachers	380	19	191	19	142	31

(1) The total for each type of education includes: principal, teacher, assistant teacher, school nurse (treated as teacher in Japan), lecturer.

(2) There is no assistant teacher for the national schools; they exist only in local schools.

(3) In 1950, in elementary school, there were 198,740 teachers, 77,732 assistant teachers, for a total of 307,170 persons called "teachers". In upper secondary schools for a total of 82,945 persons called "teachers" (excluding lecturers), teachers were 73,540 and assistant teachers 2,824.

Source: Education in Japan (1956-1960-1965). Annual report of the Ministry of Education.

Table 3

Number of full-time teachers by level of preparation 1956-1965

(elementary, lower secondary, upper secondary school teachers)

Level of Preparation	Elementary School Teachers				Lower Secondary School Teachers				Upper Secondary School Teachers			
	As of June/56	As of June/59	As of June/62	As of June/65	As of June/56	As of June/59	As of June/62	As of June/65	As of June/56	As of June/59	As of June/62	As of June/65
Total	345,189	366,111	340,619	339,884	200,091	187,899	247,195	232,600	112,363	126,053	140,011	191,413
Four Years or More of Higher Education	19,245	38,263	41,825	58,454	40,197	50,981	93,501	104,261	41,532	57,435	69,695	132,909
(Teacher Training Departments	8,949	25,137	29,671	44,614	12,312	21,995	47,554	52,492	3,242	5,690	12,407	34,857
(Others	10,296	13,126	12,154	13,840	27,885	28,986	45,947	51,769	38,290	51,745	57,288	98,052
Two or Three Years of Higher Education	200,662	209,487	194,348	190,375	134,825	117,351	136,743	116,782	63,655	60,742	62,451	53,956
(Teacher Training Departments	183,682	189,461	167,903	155,735	88,114	73,565	84,835	74,856	20,438	17,349	18,966	18,021
(Others	16,980	20,026	26,445	34,640	46,711	43,786	51,908	41,926	43,217	43,393	43,485	35,935
Upper Secondary Education	108,845	91,131	89,491	91,055	19,865	12,925	13,650	11,557	3,987	2,891	4,973	4,548
Others	16,437	27,230	14,955	-	5,204	6,642	3,301	-	3,189	4,985	2,892	-

Table 4

Percentage distribution(1) of full-time teachers by age group (1965)

Age group	Primary teachers	Secondary teachers
all ages	100	100
under 21	0.6	0.3
21 - 30	21.0	31.7
31 - 40	47.5	39.8
41 - 50	20.0	15.8
51 - 60	10.8	10.6
60 and over	0.1	1.7

(1) In 1965 for a figure of 401,549 full-time secondary teachers, 25.1 per cent were teaching sciences, 8.8 per cent vocational subjects, 41.6 per cent humanities and 24.5 per cent other subjects.

Source: Report on Survey of Characteristics of Teachers, 1965 (in Japanese).

Table 5

Enrolment in elementary and lower secondary schools(1) (public and private) 1950 - 1965

Years	Elementary	Lower Secondary
1950	11,178,003	5,254,464
1955	12,266,952	5,883,692
1960	12,590,680	5,899,973
1965	9,775,532	5,956,630

(1) Compulsory education.

Source: Education in 1965, Japan. Annual report of the Ministry of Education.

Table 6

Enrolments in full-time and part-time upper secondary schools(1)
(public and private) 1950 - 1965

	Full-time pupils			Part-time pupils			Full-time and part-time pupils		
	Total	General	Technical	Total	General	Technical	Total	General	Technical
1950	1,508,476	1,032,171	476,305	402,559	213,955	188,604	1,911,035	1,246,126	664,909
1955	2,036,967	1,255,707	781,260	534,648	282,386	252,262	2,571,615	1,538,093	1,033,522
1960	2,710,115	1,624,700	1,085,415	515,830	256,126	259,704	3,225,945	1,880,826	1,345,119
1965	4,553,759	2,741,733	1,812,026	511,898	271,502	240,396	5,065,657	3,013,235	2,052,422

(1) Excluding pupils of advanced courses and special courses.

Source: 1950: Annual report of the Ministry of Education, 1950 (in Japanese).
1955: Report on Basic School Statistics, 1955 (in Japanese).
1960 and 1965: Education in 1950 and 1965 - Japan. Annual report of the Ministry of Education.

Table 7

Full-time enrolments, total enrolments and graduates in higher educational institutions (university and junior colleges - public and private) 1950 - 1965

	1950-51(1)		1955-56(1)		1960-61(1)		1965-66(1)	
	M F	F	M F	F	M F	M	M F	F
First time enrolments universities								
Grand total	104,902(2)	9,335(2)	136,467(3)	20,246(3)	166,761	24,508	249,917	44,232
of which teacher training	-	-	(8,964) 11,259	(4,859) 2,669	12,932	5,464	14,246	7,436
Junior colleges								
Grand total	13,839(2)	5,617(2)	37,544	21,398	42,318	29,625	80,563	63,763
of which teacher training	-	-	478	336	2,257	2,231	7,007	6,967
Total enrolments universities								
Grand total	222,044	16,759	503,704(3)	62,564(3)	601,464	82,651	895,465	146,560
of which teacher training	35,794	7,419	(21,482) 39,432	(11,084) 6,797	55,416	21,249	56,881	27,961
Junior colleges								
Grand total	13,839	5,617	76,025	40,905	81,528	54,873	145,458	108,670
of which teacher training	71	29	819	551	4,419	4,304	11,276	11,189
Graduates:								
Universities								
Grand total	42,075(4)(5)	-	107,867(3)	15,551(3)	121,979	17,699	178,279	29,818
of which teacher training	400(4)(5)	-	19,164(3)	6,860(3)	13,475	5,099	12,962	6,350
Junior Colleges								
Grand total	46,434(4)(5)	-	31,117	18,099	32,893	23,799	55,371	42,447
of which teacher training	11,956(4)(5)	-	1,016	951	2,038	1,950	4,032	3,991

(1) Academic year begins 1st April and ends 31st March.

(2) First year enrolments.

(3) These figures include two-year teacher training courses provided by universities. The figures in parentheses show numbers of students enrolled in these two-year courses.

(4) The figures for 1950 concern the "old system colleges". The data for these college graduates and for the university graduates in 1950 are drawn from "Demand and supply for university graduates", Japan, Ministry of Education, 1958 (appendix).

(5) Teacher training and physical education.

Source: Report on Basic School Statistics, 1955-1960-1965 (in Japanese).

NORWAY

NOTE ON TEACHER TRAINING

Primary school teacher training

The training of teachers for primary schools, continuation schools and folk high schools is given in teacher training colleges (laererskoler). The teachers in continuation schools have often some kind of additional training.

Courses in the teacher training colleges are of two types:

- A 4-year course for pupils(1), aged 17, taking entrance examination after the completion of lower secondary courses (continuation school, folk high school, "realskole" and upper stage of the new comprehensive school).
- A two-year course for pupils, aged 19 (minimum), with the matriculation examination (concluding upper general secondary education); there are two lines in this two-year course: the ordinary one for the holders of the matriculation examination of any stream of the gymnasium, the English one only for the holders of the matriculation examination coming from modern language stream of the gymnasium; during the two-year training, these student-teachers are expected to become competent to teach English, as well as the normal subjects, in the primary schools.

In recent years, experiments in teacher training were carried out: for example, a three-year "matriculation" line, a four-year line based on the "realskole" examination and a two-year line with a year's practical teaching between the first and the second classes. A domestic science line has also been tried. Graduates of the two main lines, described above, have the same standing.

Primary teachers, generally after a short period of teaching service, can take various supplementary courses which will qualify them in one or more specialised subjects. It entitles them to teach these subjects in the different kinds of lower secondary schools and further education schools. This additional training is given in:

---

(1) Minimum age for entrance is 17 years, but most of the pupils are older.

(i) the state school for physical education;

(ii) the state school for teachers of handicrafts and drawing;

(iii) the state school for teachers of arts and crafts (women);

(iv) the state school for teachers of domestic science;

(v) the college of music.

(vi) These courses usually last one year. Primary teachers can also take additional training to be teachers in the "youth classes" of the new comprehensive school(1).

General secondary school teacher training

The qualification of "adjunkt" is required to teach theoretical subjects in the new "youth classes" in the nine-year comprehensive schools (7th-9th grade). The "adjunkt" may have either a full university degree (see below) or be a primary teacher with additional training in certain academic subjects. Courses for this last purpose have started at the Universities of Oslo and Bergen and at the State College for Teachers in Trondheim. Primary school teachers receive a specialist training to honours standard in two subjects. A total of not less than two years' training after leaving the teacher training college is required.

The other group of teachers in lower general secondary education ("realskole", upper grades of the new comprehensive schools) prepare for the adjunkt-qualification through a first degree (cand. mag. examination) at university. This degree generally takes four years of study after the matriculation examination in a science faculty and five years in an arts faculty. For an arts degree, students take three subjects, two of them intermediate and one minor. For a science degree, various combinations are possible.

---

(1) Some of the State teachers' training colleges, the State College for Teachers and 2 summer courses are giving additional training in theoretical subjects. It is not unusual for teachers to pass a diploma in "grunnfag" or "mellomfag".

56

Qualification as "lektor" is based upon a higher university degree ("cand. philol." or "cand. real.") entitling to teach at gymnasium level (general upper secondary). This degree takes generally six years of study in a science faculty and seven years in an arts faculty. To qualify the candidate must take one major subject at university either after the "cand. mag. examen" or in addition to the teacher training college certificate and one intermediate subject.

A minor subject generally requires a year, an intermediate one, one and a half years of study. The course is preceded by a preliminary course of not less than a year's duration. At the conclusion of the preliminary course all students (science and arts faculties) must take a four-hour written examination in philosophy (logic, psychology, history of philosophy). One semester is spent in preparation for this examination. Science students take a mathematics examination (preparation one semester) and arts students an examination in Latin. One or more papers must be submitted by the student during the course. For a major subject, he must present a thesis.

Pedagogical training is given in a training college ("pedagogisk seminar") during six months. This training is both theoretical and practical. The "pedagogisk seminar" have a full-time principal and a full-time deputy principal. Both must be experienced secondary school teachers, one in arts and the other in science. Each is usually required, in addition to his training college duties, to teach for about five hours a week in a secondary school in order to maintain contact with practical school work. There they give lectures on educational subjects and teaching methods and visit the secondary school teacher trainees during practice teaching lessons. The theoretical part of the pedagogical training is given mainly in the form of lectures. The practical part of professional training takes the form of practice teaching in a secondary school under the supervision of experienced teachers. During one-third of the lessons, the trainee is expected to listen, then he gives one-third of the lessons, under supervision, and one-third alone. Each trainee will teach his three subjects. The teacher-tutor has normally at most one trainee per class and per subject. During this time of practice, the trainees are inspected two or three times by the principal of the "pedagogisk seminar" or his deputy who, in consultation with the supervising teachers, gives each trainee a mark for practical teaching ability. There is a written examination in theory covering pedagogy, methods of teaching various subjects, psychology and hygiene.

Vocational School Teacher Training

Apart from the above-listed specialised teacher training schools, there is a special school and a special course for teachers in the vocational schools for the manual trades and industry. The full-time training course at the "State Vocational Teacher Training College" originally planned for and conducted on an 18 month basis, now lasts only six months. It is for teachers already in employment. The other type of training is a "state course for vocational school teachers" for teachers already in employment. It is a part-time course. The course comprises 25 week summer terms. During the winter, the teacher trainee teaches at a vocational or apprentice school. At the same time, he studies on his own (by correspondence) and attends 6 week-end seminars. The student teacher's work is supervised by the head of the course who visits him at his work several times during the year and gives him help and guidance as he may require.

The special subject teacher is not subject to any minimum scholastic qualifications. He must have a good general qualification and special training in his subject. He is normally recruited at the master-craftsman or skilled worker levels, or has other technical qualifications required for teaching the specific course in question. Teachers of general education subjects for the vocational, apprentice or assimilated schools must have the same basic educational qualifications as the teacher recruited for the primary, continuation and real schools and the folk high school. They must at least complete the curriculum of a secondary grammar or commercial school or a technical college before being accepted for state vocational teacher training. Many of them have passed the teachers' college examination and are qualified to teach in the primary and continuation schools.

The special subject teacher ("faglaerer") may teach his subject in general education schools (primary, secondary) as well as in the various types of vocational/technical schools. The basic law of 16th June, 1961, concerning training qualifications of teachers in any of the vocational schools, specifies that the vocational teachers must have the same basic qualifications as those held by the corresponding categories of teachers of general education (at primary and secondary level) and gives them equivalent status.

As the full-time course was not sufficient to meet the rapid needs of vocational teachers, the part-time teacher training course was created in 1960. As the vocational teacher has been recruited on the basis of his trade qualifications and scholastic record, his training must therefore concentrate on the pedagogical/didactic aspects of his functions and on up-dating and broadening his trade knowledge to take into account the new developments in technology.

Special pedagogical courses are offered to graduates from university studies in technology, business administration and agriculture who want to become teachers in such subjects in technical education at the upper secondary level.

Qualification requirements for teachers in general subjects in technical education are the same as for teachers in the gymnasium.

STATISTICAL DATA

List of Tables

TABLE 1 Number of teachers employed in primary education by qualification, by sex from 1950 to 1965.

TABLE 2 Number of teachers employed in general secondary education by qualification, by sex from 1950-1965.

TABLE 3 Number of teachers in vocational and technical education at secondary level by qualification from 1950-1965.

TABLE 4 Enrolments in primary and secondary (general and technical) education from 1950 to 1965.

TABLE 5 Number of enrolments and graduates of primary teacher training from 1950 to 1965.

TABLE 6 Enrolments in vocational teacher training, by sex in 1965/66.

Table 1

Number of teachers employed in primary education(1) by qualification, by sex from 1950 to 1965

	1950-51		1955-56		1960-61		1965-66	
	M F	F	M F	F	M F	F	M F	F
Full-time teachers								
Qualified	-	-	-	-	(14,928)(2)	-	14,804	7,898
Non-qualified	-	-	-	-	(3,572)(2)	-	2,088	1,260
Total	11,925	5,198	14,321	6,643	16,056	-	16,892	9,158
Part-time teachers: total	-	-	1,898	-	2,444	-	-	-

(1) Includes continuation schools (for statistical reasons).

(2) These two figures concern both full-time and part-time teachers.

Table 2

Number of teachers employed in general secondary education(1) by qualification, by sex from 1950 to 1965

	1950-51		1955-56		1960-61		1965-66	
	M F	F	M F	F	M F	F	M F	F
Full-time teachers								
Qualified	-	-	2,110	252	-	-	5,449	1,291
Non-qualified	-	-	831	292	-	-	352	131
Total	2,328	451	2,941	544	3,712	1,144	5,801	1,422
Part-time teachers: total	917	-	1,082	-	1,946	-	2,414	-

(1) Until 1960-61 information was only given as to the numbers of "lektorer", "adjunkt" and "others".

(2) For this year, it includes: comprehensive schools: grade 7-9; "folk high schools", "realskoler", "gymnasium".

Table 3

Number of teachers in vocational and technical education at secondary level by qualification from 1950-1965

	1950-51	1955-56	1960-61	1965-66
	M F	M F	M F	M F
Full-time teachers				
Qualified	-	-	-	(4,086)(1)
Non-qualified	-	-	-	(3,826)(1)
Total	1,920	5,980	2,677	(7,912)(1)
Part-time teachers: Total	963	1,133	4,691	

(1) These data seem to refer to both full-time and part-time teachers.

Table 4

Enrolments in primary and secondary (general and technical) education from 1950 to 1965

	Primary(1)	General Secondary(2)	Technical Secondary
1950-51	342,659	37,435	46,246
1955-56	447,250	49,102	48,106
1960-61	480,021	92,470	50,376
1965-66	449,318	159,187	51,316

(1) Primary continuation schools and upper stage of primary schools in 1960-61; upper stage of primary school excluded in 1965-66.

(2) Upper stage of primary schools and folk high schools included in 1965-66.

Table 5

Number of enrolments and graduates of primary teacher training(1) from 1950 to 1965

	1950-51		1955-56		1960-61		1965-66	
	M F	F	M F	F	M F	F	M F	F
Enrolments	1,823	-	2,304	1,231	2,297(2)	-	3,832(3)	-
Graduates	892	446	961	514	1,409	-	2,302	-

(1) Four-year and two-year training.

(2) Including 199 pupils in three-year classes on an experimental basis.

(3) Including 509 pupils in three-year classes on an experimental basis.

Table 6

Enrolments in vocational teacher training, by sex in 1965-66

	1965-66	
	MF	F
State vocational teacher training college course (full-time)	1,010	757
State course for vocational school teachers (part-time)	83	68

A CASE STUDY IN THE APPLICATION OF TEACHER DEMAND AND SUPPLY MODELS IN NORWAY(1)

Introduction

The first attempt in Norway to analyse the teacher situation with the help of formalised models for supply and demand was undertaken by the Planning Department of the Ministry of Education in connection with the preparation of the Government's four year plan, 1966-69. Further work within the department, particularly by cand. econom. Per Polden, led to the preparation of more refined models: one fairly elaborate model for the "system requirement" for teachers, one more simplified flow model for pupils, and one rather sketchy model of teacher supply (stock of teachers). These models are presented in the annex to this paper.

Most of the Department's work has gone into the preparation of the model for teacher requirements, which is in fact a by-product of the general cost models prepared by the Department for compulsory education in Norway. The aim of these models is to list all major factors which may influence the long-run development of educational costs and to bring out the interdependencies between these factors within a logical framework. Teacher input being the main single cost factor in this context, such cost models provide an excellent starting point for teacher demand models.

The purpose of our recent study of teacher demand and supply is not primarily to forecast the number of teachers required at any time in the future, neither is it to plan the future capacity of teacher training institutions. The study is mainly an exercise to demonstrate the relationship between various possible sets of legal regulations for compulsory education in Norway, and the consequent requirements for teachers. In demonstrating this, we also hope to illustrate the extent to which decisions, by central political authorities, will decide the actual requirements for teachers in the future. The wide span between maximum and minimum requirements, according to the assumptions applied in our analysis, is practically only due to variations in possible decisions by political bodies.

---

(1) This paper represents a contribution by the Department for Planning and Research of the Norwegian Ministry of Education to the Committee for Scientific and Technical Personnel's "Study on Teachers". It has been prepared by Kjell Eide, Head of this Department.

Thus the main lesson we hope should be drawn from our study is that forecasting teacher requirements, or future shortages and surpluses, is primarily an exercise in forecasting political behaviour. In demonstrating this we also want to advocate less emphasis on this kind of forecasting, and more concern about the systematic analysis of means/ends relationships in the field of education.

Closely connected with this is our wish to focus some attention on certain long-term consequences of our present policies. At present there is very strong pressure for increased standards in Norwegian schools. These wishes for improved teaching standards are nearly always expressed in terms of increased supply of teachers. The gradual yielding to such pressures is a consistent trait of Norwegian school development since the war. A prolongation of this trend, however, raises some very real problems to which we shall return at the end of this paper.

Before we presented the results of our study, we found it necessary to put forward certain warnings to the readers. It may be useful to repeat these warnings even in this context. They refer to problems involved in all types of manpower forecasting.

In analysing future developments neither demand nor supply can be viewed only from a quantitative point of view. Even qualitatively the demand will change as time passes, in the sense that occupational functions are changed and consequently also the type of knowledge required for the performance of such functions. Even on the supply side, qualitative changes must be assumed. Otherwise no quantitative balance can remedy increasing gaps between the actual requirements of the teaching function and outdated educational qualifications.

For teachers in particular, the professional requirements in various positions are much more formalised and specified than are normal in other occupations. In our country there is a very strict connection between type of job and educational background. However, in the context of a long-term analysis it is necessary to remember that this very strict definition of qualification requirements for teachers does not represent a necessity. Other countries are often far less formal in this respect. Furthermore, they may have very different ideas about what qualifications are really needed, and there is no reason to believe that our own ideas in this respect represent eternal wisdom. On the contrary, there are strong reasons to believe that our own ideas about qualifications needed for teachers will change substantially as time goes by.

When discussing future demand and supply of teachers one tends to think in terms of persons who have qualifications corresponding to the formal requirements of today. This is implicitly assumed also in the following analysis. It should not, however, be forgotten that this is a rather arbitrary assumption. By 1985, we may have arrived at very different conclusions as to educational and other qualifications needed for the teaching profession.

Demand for Teachers in Compulsory Education

Our most elaborate analysis of teacher demand was undertaken in relation to compulsory education, since detailed cost models were available for the study of this part of the educational system, which is, anyway, the one requiring most teachers. The analysis is based on the teacher demand model presented in the annex to this paper. In the following text, however, only a few "strategic" factors are explicitly presented, the assumption being that each is determined by an autonomous sub-model(1).

Our analysis will concentrate on the five following factors:

(a) Number of pupils
(b) Hours taught in full class
(c) Extra hours
(d) Class size
(e) Teaching obligations.

Even if this list is not exhaustive, the factors mentioned are sufficient to explain the development in the demand for teachers during the last ten years in Norwegian compulsory education. There is reason to believe that even in the future, these factors will be responsible for most changes in teacher demand.

---

(1) This assumption of autonomy has not been rigidly applied to all the factors.

(a) Number of pupils

Compulsory education in Norway is at present being extended from seven to nine years. The total number of pupils in 1965 was approximately 450,000. By 1969, according to the Government's four-year plan, 70 per cent of the age group 13-15 is assumed to attend compulsory education. Before 1975, the assumption is that participation should have reached 100 per cent. These participation rates, combined with available demographic forecasts, lead to the following estimates of pupil numbers in compulsory education for the next twenty years:

	Grades 1 - 6	Grades 7 - 9
a_o 1965	368,000 (0%)	83,000 (0%)
a_1 1970	360,000 (- 2%)	150,000 (+ 81%)
a_2 1975	371,000 (+ 1%)	178,000 (+114%)
a_3 1980	414,000 (+ 12%)	186,000 (+124%)
a_4 1985	454,000 (+ 23%)	209,000 (+152%)

The figures in brackets indicate increase or decrease in percentage of the a_o alternative (present situation).

The figures above show that after the introduction of the nine years' compulsory school, there will only be a few "quiet" years before pupil numbers are expanded by a new birth wave. The top of this wave in terms of compulsory school pupils is expected in the late 1980's.

If compulsory school teaching were given by fully-qualified teachers in full posts without overtime, the number of teachers in 1965 would have been approximately 21,500(1). The change in pupil numbers alone would require nearly 14,000 new teachers during the next twenty years (out of which some 6,000 might be transferred from existing schools to be substituted by the upper stages of the nine years' compulsory school). Teacher requirements increase more rapidly than the number of pupils, since pupil numbers primarily increase in the upper, more teacher intensive grades of compulsory education.

---

(1) The actual number in the school year 1964-65 was 19,134 teachers in full posts. The difference is covered by part-time teachers and by overtime.

(b) Hours taught in full class

The number of hours taught in full class ("pupil hours") is here measured in terms of the number of hours every pupil is supposed to be taught in the course of a week. In 1965 pupil hours were on average 22.7 in grades 1-6 and 36 in grades 7-9.

A recent Royal Commission report on compulsory education proposes new maximum and minimum limits for pupil hours in compulsory education. In primary schools (grades 1-6) the legally permitted range would be from 21 to 24.5 hours a week, which in itself would reduce somewhat the average number of pupil hours. The general trend, however, has for many years been towards an increasing number of pupil hours, mainly because of attempts from countryside school districts to catch up with the longer hours of school districts in more central areas. The Royal Commission, therefore, assumes that by the time the nine years' compulsory school is fully introduced, the average number of pupil hours should be 23.

In the long-run it seems doubtful whether this assumption can be maintained. The introduction of a five-day week in the school might lead to a reduction of the number of hours taught in the higher grades, but hardly in primary education.

For the grades 7-9, the Royal Commission estimates the future average pupil hours to be 33.5 per week. The five-day school week may lead here to a total of 30 hours.

In our analysis we have included the following long-term alternatives:

	Grades 1-6		Grades 7-9	
b_0	22.7 hours per week	(0%)	36.0 hours per week	(0%)
b_1	23.0 " " "	(+ 1%)	30.0 " " "	(-17%)
b_2	25.0 " " "	(+10%)	33.5 " " "	(- 7%)

With the assumed number of pupils for 1985 (cf. a_0), alternative b_0 would require somewhat more than 35,000 teachers. Alternative b_1 would lead to a saving of 2,500 teachers, while alternative b_2 would require 800 more teachers. The difference between the two alternatives b_1 and b_2 is 3,300 teachers, or nearly 10 per cent of the whole stock of teachers.

(c) Extra hours

Extra hours are here taken to mean the additional teaching hours caused by the division of classes into two or more groups and by remedial teaching. We have also included "calculated teaching hours" for pedagogical supervision and administration(1), and hours taught by alternates while teachers are on paid leave (due to illness, pregnancy, military service, further training, etc.).

On the average, extra hours in 1965 amounted to 6.3 weekly hours per class in the grades 1-6 and 18.9 hours per class in the grades 7-9.

Increase in the number of extra hours is a major cause of the expansion in teacher demand in recent years. They also constitute perhaps the most important reason why education in the upper stages of compulsory schooling is much more expensive than in the lower grades. When judging the possible future development of extra hours in compulsory education, it should be borne in mind that pressure for standard improvements in education is strongly concentrating on measures requiring an increased number of extra hours.

Such pressures concentrate heavily on increased organisational differentiation, leading to a greater number of hours taught in divided classes(2). One of the more radical proposals is that all classes in the first grade should be split in two. This proposal alone would require an increase in the stock of teachers in primary education of 11 per cent.

The Royal Commission on compulsory education assumes that organisational differentiation will have to depend upon the size of schools, in the way that small schools will need more hours taught in divided classes than the bigger schools. Later on the State Council for Experiments in Schools concluded from their research that it should be possible to operate grades 7-9 with the same number of hours taught in divided classes in schools of all sizes down to two parallel classes. The Council also concludes that it should be possible to operate with a lower number of hours taught in divided classes than is the case at present.

---

(1) Such hypothetical "teaching hours" are calculated on the basis of the actual reduction in teaching obligations which follows supervisory or administrative functions in the school.

(2) "Hours taught in divided classes"are here taken in the net sense, as hours taught in combined classes have been deducted.

This is, of course, a question of how far one is willing to go in reducing the range of choice in terms of subjects and instruction levels in grades 8 and 9, particularly in the small schools. A few years ahead - e.g. until the nine years' compulsory school has been completed - it may be possible to maintain the degree of organisational differentiation at today's level. One of our alternatives is based on this assumption. In the long-run, however, it seems likely that one must expect present regulations to yield from the pressure put against it, which would lead to an increased number of hours in divided classes. Our long-term alternative (c_2) takes this into account.

The pressure is also considerable in the direction of more remedial teaching and further reduction of teaching obligations for supervisory and administrative personnel.

The expected increase in the proportion of female teachers may lead to a certain increase in leave hours.

In our analysis we have therefore studied one alternative according to which remedial teaching constitutes an addition of 10 per cent to the number of pupil hours (against 7.5 per cent and 5.5 per cent today in grades 1-6 and grades 7-9 respectively). Administration and supervision hours are assumed to constitute 10 per cent of the numbers of hours actually taught (against 6.3 per cent and 7.3 per cent respectively today). Hours on leave are set to 5 per cent of all other hours (against 4.5 per cent today).

In a long-term alternative we have also on top of all this included a 5 per cent addition for further training of teachers with full pay. A system which would provide the teachers with the right to a certain amount of paid leave for further training has already been proposed by two successive Royal Commissions on teachers' wages and working conditions. The arrangements foreseen in our alternative would provide each teacher with the right to half a year's leave every tenth year of duty.

All this leads to the following alternatives for extra hours:

	Grades 1 - 6		Grades 7 - 9	
c_o	6.3 hours per week	(0%)	18.9 hours per week	(0%)
c_1	6.3 " " "	(0%)	18.9 " " "	(0%)
c_2	15.0 " " "	(+30%)(1)	28.0 " " "	(15%)(1)

While our minimum alternative c_1 corresponds to the present situation (c_o), the long-term alternative c_2 would, in 1985, require 7,250 teachers in addition to the 35,000 required by the increase in the number of pupils alone. Consequently, our long-term alternatives for extra hours taught would "ceteris paribus" lead to a 20 per cent increase in teacher demand.

(d) Class size

The average class size in grades 1-6 is today 19.5 and in the grades 7-9, 24.9.

The class size depends upon the legal maximum limit, which today is 30, and the size of the school. With constant maximum limit the average class size has in the last 15 years increased by approximately 1 per cent per year due to rationalisation of the school size structure. Material collected from local school authorities on school construction plans up to 1975 indicate a further change in the school size structure which would give an average class size of 21.9 pupils in grades 1-6.

An alternative to this would be an extreme decentralisation policy which would maintain the average class size at its present level. On the other hand, a long-term alternative assuming an even further centralisation than estimated by the local authorities up to 1975, might also be within the range of realistic alternatives. We have combined this latter alternative with the assumption that the legal maximum size of a school class will be lowered to 25 pupils. This alternative gives the same average class size as we have at present, thus corresponding to the decentralisation alternative with no change in the maximum limit.

For grades 7-9 the aggregated plans from local school authorities show an average class size of 25.7 pupils when the nine years' compulsory school has been fully introduced (against 24.9 pupils per class today). Even here we will introduce a decentralisation alternative assuming a number of school units about 35 per cent higher than according to local estimates. This would give an average class size of 24.4 pupils. We will also operate with a long-term centralisation alternative, assuming 20 per cent fewer school units than estimated by the local authorities. This alternative is again combined with the assumption that the legal maximum limit is set at 25 pupils, which would give an average class size of 22.1 pupils. All this leads to the following alternatives:

---

(1) The percentage in brackets signifies the increase in the total number of hours taught.

	Grades 1 - 6			Grades 7 - 9		
d_o	19.5	pupils per class	(0%)	24.9	pupils per class	(0%)
d_1	21.9	" " "	(-10%)	25.7	" " "	(- 3%)
d_2	19.5	" " "	(0%)	22.1	" " "	(+13%)

Based on estimated pupil numbers for 1985, alternative d_1 would "ceteris paribus" save 2,400 teachers in relation to the school size structure we have today. Alternative d_2 on the other hand would cost 2,050 teachers more than the present school size (and maximum limit) structure. The range between alternative d_1 and d_2 is close to 4,500 teachers.

(e) Teaching obligations

Teaching obligations today are 33 hours per week in primary schools and on the average 25 hours per week in grades 7-9. The Teachers' Association exercises strong pressure for a reduction in teaching obligations down to 30 hours per week in primary. This is, therefore, chosen as one alternative to present regulations. As a long-term alternative we have chosen 28 hours per week in primary and 24 hours per week in grades 7-9. We then get the following alternatives:

	Grades 1 - 6			Grades 7 - 9		
e_o	33	hours per week	(0%)	25	hours per week	(0%)
e_1	30	" " "	(+ 5%)	25	" " "	(0%)
e_2	28	" " "	(+18%)	24	" " "	(+ 4%)

In relation to the present regulations and based on pupil numbers for 1985, alternative e_1 would require 1,950 teachers more and alternative e_2 4,150 teachers more.

Combining the Various Alternatives

The preceding analysis consists of partial variations of a number of strategic factors determining teacher requirements. Normally such factors would often vary simultaneously, and over a time span of twenty years, all factors are likely to change.

The consequences of simultaneous changes in the above-mentioned factors are not a mere addition of partial consequences. If pupil numbers expand, changes in pupil hours will have even greater consequences. Increased numbers of hours taught per class, give greater effect to changes in class size. The greater the total number of hours taught, the more will changes in teaching obligations cost. The relationship between the various factors behind teacher requirements are mainly exponential in the sense that changes in one factor increases the effect of changes in others.

As previously mentioned, pupil numbers for 1985 would require more than 35,000 teachers in the nine years' compulsory school if all other factors remain constant. If this alternative is combined with the long-term alternative for the other factors mentioned above (b_2, c_2, d_2, e_2), the total need for teachers in this part of the educational system would amount to nearly 53,000 teachers. This is 17,500 more than developments in pupil numbers alone indicate, and 35,000 teachers more than we have in compulsory education today.

This alternative can be confronted with the most moderate of the alternatives above (b_1, c_1, d_1, e_1). This alternative would give total teacher requirements, in compulsory schools in 1985, of 31,500 teachers, or 3,500 less than the increase in pupil numbers should indicate. It may be necessary, however, to underline that this alternative assumes a very austere policy indeed as regards teaching standards.

The main point here is not, however, to judge the realism of the vast number of alternatives that emerge from various combinations of the factor values presented above. What we would particularly like to point out, is that with the same pupil numbers assumed for 1985, the two alternative combinations mentioned above deviate by more than 21,000 teachers. The maximum alternative is nearly 70 per cent higher than the minimum alternative. It is worth while noting that this range of variation is fully due to variations in assumptions concerning decisions by responsible political bodies in the course of the next twenty years. This provides an appropriate illustration of the dilemma facing those who want to forecast future developments in the labour market for teachers.

Teacher Demand at the Upper Secondary Level

The "system requirements" for teachers in the "gymnasium" (three year grammar school), the "people's high schools" and the third grade in the old "realskole" was in 1965 about 5,000 full-time teachers without overtime. The corresponding teacher requirements in vocational schools can be estimated at 4,000 teachers(1).

In 1965, approximately 50 per cent of the age group 16-18 went to full-time school. A simplified analysis based on widely accepted assumptions as to the future development of transition coefficients within a pupil flow model, leads to the conclusion that twenty years from now close to 100 per cent of the age group 16-18 years of age would be in school, and also school participation (below university level) of older age groups will increase substantially.

No detailed analysis has been undertaken of the likely changes in teaching standards in schools at the upper secondary level. Vocational schools have today a very low maximum limit for class size. The expectation that Norway gradually will introduce schools of a more comprehensive type even at this level, makes it, however, realistic to expect a higher degree of organisation differentiation in general education.

The number of pupil hours will perhaps be reduced when the five-day school week is introduced. Teaching obligations, however, will be under constant pressure for further reduction.

A rough estimate leads to the conclusion that teacher requirements in schools at the upper secondary level are likely to treble in the course of the next twenty years. Even here, however, substantial variations are possible, according to decisions on education policy to be made in the years to come.

---

(1) The actual number of teachers in full post in these types of schools was about 7,000 in 1965. The difference is covered by part-time teachers (especially in vocational schools) and overtime.

Before leaving the question of teacher requirements, it may be worth while to point out the following facts of the Norwegian situation: in the course of the next twenty years we expect to have an expansion of compulsory education from 7 to (at least) 9 years, a very rapid growth in voluntary demand for education at the upper secondary level, and a new birth wave invading our schools. In spite of this, realistic estimates on the total number of pupils in primary and secondary schools by 1985 would not range from less than 700,000 to more than 800,000. Most people would operate with a much narrower range of realistic possibilities. The long-term need for education resources stemming from social demand for education and from manpower requirements, could therefore "a priori" be estimated within a range of less than ± 7 per cent.

If we look, however, at the possible variations in teacher requiring measures determining teacher standards, the realistic range of choice is far greater. Each of the four factors discussed in our analysis may vary over a greater range than all social and manpower demand factors together. We thus find that in the Norwegian case a study of future teacher requirements based on such traditional factors as social demand and/or manpower requirements is of very little value if additional factors - potentially at least as important - are not included in the analysis.

Supply of Teachers

In Norway, teacher training usually takes place in teacher training seminars or in the university faculties of science and the humanities. Vocational schools in many cases require other teacher qualifications than provided by the training institutions mentioned above. The demand for and supply of vocational school teachers is therefore excluded from the following analysis.

Teacher training seminars have since the 1940's operated with a "numerus clausus", the Government deciding each year upon the number of applicants to be admitted to these schools. The relevant university faculties, on the other hand, offer free entry to everybody who has completed general secondary education.

The fact that the total teacher training capacity primarily depends on political decisions makes direct calculations of alternatives for teacher supply less interesting. Instead we have tried to estimate the total supply of new teachers which would follow from the maximum and minimum alternatives for teacher requirements calculated in the previous sections. This might at least give us a maximum and a minimum limit for the teacher training capacity needed in the long-run.

Combining the teacher requirement figures for education at compulsory and the upper secondary level provides us with a minimum alternative of 47,000 teachers and a maximum alternative of 68,000 teachers in 1985.

Even assuming that the universities will continue to maintain open entry to the faculties of science and the humanities, the supply of teachers from these faculties, of course, still remains very uncertain. A set of assumptions, which should not be elaborated here(1), points towards a total number of university students of 50,000 around 1985. If we assume that students in science and the humanities maintain their proportion of the total number of students, a total of 22,000 graduates in disciplines relevant to teaching will be produced in the period up to 1985.

Data from recent years show the extent to which graduates, from the faculties of science and the humanities respectively, are found in the teaching profession a given number of years after their graduation. These figures show a much lower teacher-percentage in lower age groups. Since historic data are scarce on this point, we do not know for certain whether this is due to a trend among such graduates to prefer non-teaching work, or whether the data reflect an employment pattern according to which graduates try other occupations before they gradually enter the teacher profession some years after graduation.

Lacking a firm basis for estimates on this point, we have chosen a set of assumptions which would lead to a supply of new university-trained teachers to primary and secondary schools over the next twenty years of 11,000.

We have received the same kind of information from candidates of teacher training seminars as well as university graduates as to their participation rate in the teaching profession in relation to the number of years after graduation. The following table for 1963 shows the percentage of graduates from teacher training seminars who were not found as teachers in primary or secondary schools:

---

(1) These assumptions are consistent with the previous estimates of school participation rates at the upper secondary level.

	Male	Female
1 - 2 years after graduation	15%	18%
3 - 7 " " "	15	25
8 - 12 " " "	18	37
13 - 17 " " "	18	41
18 - 22 " " "	26	36
23 - 27 " " "	22	28
28 - 32 " " "	25	20

Again we do not know whether this pattern reflecting up to 30 years of Norwegian school history is a stable one, likely to repeat itself for future years. There are indications that drop-out from the teaching profession has increased in recent years, but no exact data are available on this point.

The total stock of full-time teachers in non-vocational schools in 1965 was approximately 28,000. Among those some 3,000 were without the necessary formal qualifications for permanent employment as teachers. In the long-run most of those unqualified teachers might be assumed to be substituted by teachers with the required qualifications.

For the rest of the teachers, the actual age distribution and data about their "professional" participation rate lead to the conclusion that 10,000 will have left the teaching profession before 1985.

Even new teachers, trained now and on up to 1985, will show a certain amount of drop-out from the profession. The assumption has been made that they will follow the same drop-out pattern as is the case with the present stock. All this leads to the following calculations:

	Minimum	Maximum
Stock of teachers 1985	47,000	68,000
Stock of teachers 1965	28,000	28,000
Increase in stock	19,000	40,000
Unqualified teachers	3,000	3,000
Drop-out of 1965 stock	10,000	10,000
Drop-out among graduates 1966-85	9,000	18,000
Total graduation requirements 1966-85	41,000	71,000
University graduates	11,000	11,000
Demand for graduates from teacher training seminars	30,000	60,000

This rough calculation illustrates the consequences of the minimum and maximum alternatives for teacher requirements in 1985 as discussed in previous sections, in terms of demand for graduates from teacher training seminars.

Teacher training seminars in Norway have a duration of two years for students who have completed general secondary education, and four years for students who have only completed the "realskole" (lower level secondary). The Parliament, however, has adopted the principle that for the future, teacher training shall have a duration of three and five years respectively, the transfer from the present system occurring as a gradual process over a number of years.

Since the extension of the duration of teacher training by one year is likely to take place before 1985, we shall have 19 years' output from the teacher training seminars in the next 20 years. If this output is kept constant over the whole period, the minimum alternative would require nearly 1,600 graduates annually, while the maximum alternative would require 3,150 graduates per year.

A wide variation of possibilities exist as to the form of future teacher training. The distribution of pupils between the three years' course and the five years' course may change, one possibility being the complete abolition of the five years' course. The final year of teacher training may be taken within the seminars or it may more or less frequently be taken at other institutions, particularly at the universities. In the context of this paper this is hardly any need for the systematic spelling out of all these alternatives, since they are mainly the consequences of particular Norwegian institutional conditions. It should be sufficient to point out that the span of what seem to be realistic alternatives ranges from an average capacity requirement over the next twenty years of 4,000 student places to 12,000 student places.

The actual number of students at teacher training seminars in Norway is at the moment 6,500. However, the present school facilities are only built for a permanent training capacity of around 4,000 students, the difference representing excess utilisation of available capacity, justified by the present shortage of teachers. Even if forecasts based on our models for teacher demand and supply cannot provide an answer to the question of what the exact capacity of teacher training seminars ought to be in the future, they at least serve the purpose of establishing beyond any doubt that the present permanent training capacity of these institutions needs to be expanded. Most likely present student numbers should be at least maintained, in spite of the fact that during the last 2-3 years Norway has experienced substantial improvement in the teacher shortage situation, pointing towards something close to a balance around the turn of the decade.

Concluding Remarks

In the introduction to this paper we touched upon the problem raised by the fact that most of the pressure for improved standards in Norwegian schools takes the form of requests for more teaching staff. Increased labour intensity seems to represent the only way envisaged towards higher standards of performance in the school system.

The "maximum" alternative of teacher requirement outlined above, does include most of - but not all - those proposals for increased standards which have recently been put on the desk of the Minister of Education. To many people it would be a great disappointment that we should need as much as twenty years before the majority of these proposals might be put into practice. A fairly frequent expectation would in fact be that by 1985, teaching standards should have reached higher levels in our schools than what is implied in the acceptance of today's proposals.

On the other hand, even this, in some respects, unsatisfactory "maximum" alternative requires 40,000 more teachers than we have today in the same types of education. The question is whether this can be accepted as a realistic idea about what the future allocation of talented people in our society might be like.

The "maximum" alternative requires somewhat more than 3,000 graduates from teacher training seminars each year. Since the capacity of these schools is lower today, this means that by 1985 the number of new teacher graduates will have to be higher than the average for the twenty-year period. In addition to graduates from teacher training seminars, come new teachers trained in the universities - at least as many, it seems, as those trained within the seminars.

What does this mean in terms of allocation of talented youth? The age group of 20 years in Norway will stay around 60,000 for a fairly long period ahead. According to the assumptions mentioned above, more than 10 per cent of the age group will have to enter teacher training. This means that recruitment for teacher training in 1985 should correspond to the total number of graduates from general secondary education in 1961, or to twice the corresponding figure for 1953. Such figures are bound to raise certain fundamental questions.

We have not in this paper discussed whether public budgets can possibly cover the costs of a standard improvement in our school system such as involved in our "maximum" alternative. In this context one would also have to take into account that the real wages of teachers must be assumed to increase at least in step with real wages for other groups in society. Contrary to the situation in almost all other occupations, however, the assumption is practically never made, for the teacher occupation, that labour productivity should increase more or less in step with the increase in real wages. It is typical that our model for teacher requirements includes no assumption about increased productivity of teachers.

If in spite of this we assume that the budgetary problem can be solved, it still remains to judge, from the realistic point of view, the assumption that the necessary number of recruits for teacher training will come forth. A closer analysis of this assumption seems to point to the following conclusion:

> Recruiting the required number of new teachers at the present level of personal qualifications would require a tremendous emphasis by society upon the teaching function, to the extent that most talented youth are fed back from teaching institutions into teaching, at the expense of all other intelligence-requiring occupations. Teaching is, and may be expected to remain, a high priority function, in Norwegian society. It does not seem likely, however, that we shall experience anything like the kind of complete priority dominance which corresponds to the assumption above.

Another possibility would be to recruit the needed number of teachers at the expense of their average qualification level. This, however, is hardly compatible with teaching methods and techniques as practiced in Norwegian schools of today.

This seems to leave us with only one alternative: To look for other means of improving teaching standards than just feeding our school system with more and more teachers. Here we are faced with perhaps the most basic dilemma in connection with the further development of our school system.

On the one hand, among teachers and many others there exists a strong dislike in the "industrialisation" of teaching, in spite of the fact that this is the way every other industry has chosen in order to increase labour productivity. It seems strange that this dislike should be so widespread among teachers, since maintenance of the present "handicraft" techniques in teaching must inevitably lead to a reduction in the average quality of the teacher group, and consequently also in their status in society. This again will have consequences on teacher recruitment; as has already been the case in a number of countries. For the school, such a development may have consequences for teaching standards which more than outweigh possible advantages gained through teacher-requiring measures aiming at increasing standards.

It should be kept in mind that this is not a problem relevant to education alone. In most fields of human activity there was a time when the choice had to be made between alternatives of the kind mentioned above. It is extremely difficult to see how the educational sector will be able to break out of this vicious circle in any other way than what has been the case in all other fields: through substituting human labour by greater input of other resources.

If - at least in principle - a higher degree of consensus could be reached on this point, it might be possible to concentrate on the essential task of developing the role of teachers in our future society. It can not be excluded that this future role may be at least as important and exciting as the old one.

ANNEX

A Model for the Analysis of the Demand for and Supply of Teachers in Norway

Introduction

This draft model for a systems analysis of the demand for and supply of teachers aims primarily at providing a basis for discussion and further work. The longer term objective, however, should be the systematic analysis of the demand for and supply of teachers in the total Norwegian school system below university level.

In this draft, special emphasis has been put on the explicit presentation of those factors which contribute most to the supply of and demand for teachers. An attempt has also been made to build into the model available knowledge about how the school system actually functions, its organisational structure or "production structure". The way pupils are grouped in schools, classes, etc., establishes certain structural relationships between the different variables in the system. These relationships must be made clear in order to ensure consistency between the many assumptions upon which supply and demand estimates must be based. The mathematical form of the following analysis is chosen in order to facilitate the demonstration of how specific estimates of this type relate to specific assumptions underlying the analysis.

The draft model is in the following version divided into three sub-models. This is for practical reasons in order to avoid a too complex system, which would hamper overview and understanding.

The choice of regarding certain magnitudes within the model as constants, is based upon the situation in Norway at the present moment, and the time range of the foreseen projections. In another situation, or with another time perspective, this choice might have been different.

Of special interest in this context are those factors which can be regarded as policy instruments. Many of those are in fact determined by local authorities - the counties of the communes - although central government may influence their actual values through the system of legal control and financial support. Assumptions as to the future values of such variables, which may have decisive effect on teacher demand or supply in the long-run, are very uncertain indeed.

The practical use of a model such as the one below, is therefore not so much to work out definite predictions as to teacher demand and supply at a given point of time in the future. The model is primarily suited for the practical demonstration of what consequences are likely to follow from various types of relevant decisions concerning the school system. It should also offer possibilities for a clear confrontation of various alternative strategies for educational development in terms of their consequences for teacher resources. This may prove to be a valuable instrument for decision-making in educational policy.

1. The System Requirements for Teachers

Equations

1. $$L^t = l_1 \cdot E_1^t + l_2 \cdot E_2^t + l_3 \cdot E_3^t + l_4 \cdot E_4^t + l_5 \cdot E_5^t + l_6 \cdot E_6^t + l_7 \cdot E_7^t + l_a \cdot E_a^t + l_u \cdot E_u^t + l_{10} \cdot E_{10}^t + l_f \cdot E_f^t + l_r \cdot E_r^t + l_g \cdot E_g^t + l_{fh} \cdot E_{fh}^t + l_y \cdot E_y^t$$

2. $$l_1 = \frac{(Tu_1 + Tr + T_a^b)}{A_b \cdot B_b} \cdot (1 + P_b)$$

3. $$l_2 = \frac{(Tu_2 + Tr + T_a^b)}{A_b \cdot B_b} \cdot (1 + P_b)$$

4. $$l_3 = \frac{(Tu_3 + Tr + T_a^b)}{A_b \cdot B_b} \cdot (1 + P_b)$$

5. $$l_4 = \frac{(Tu_4 + Tr + T_a^b)}{A_b \cdot B_b} \cdot (1 + P_b)$$

6. $$l_5 = \frac{(Tu_5 + Tr + T_a^b)}{A_b \cdot B_b} \cdot (1 + P_b)$$

7. $$l_6 = \frac{(Tu_6 + Tr + T_a^b)}{A_b \cdot B_b} \cdot (1 + P_b)$$

8. $$l_7 = \frac{(Tu_7 + Tr + T_a^b)}{A_b \cdot B_b} \cdot (1 + P_b)$$

9. $$l_a = \frac{(T_{ua} + T_r + T_a^b)}{A_b \cdot B_b} \cdot (1 + P_b)$$

10. $l_u = \frac{(T_{uu} + T_r + T_a^u)}{A_u \cdot B_u} \cdot (1 + P_u)$

11. $l_{10} = \frac{(T_{u10} + T_r + T_a^b)}{A_u \cdot B_u} \cdot (1 + P_{10})$

12. $l_f = \frac{(T_{uf} + T_a^f)}{A_f \cdot B_f} \cdot (1 + P_f)$

13. $l_r = \frac{(T_{ur} + T_a^r)}{A_r \cdot B_r} \cdot (1 + P_r)$

14. $l_g = \frac{(T_{ug} + T_a^g)}{A_g \cdot B_g} \cdot (1 + P_g)$

15. $l_y = \frac{(T_{uy} + T_a^y)}{A_y \cdot B_y} \cdot (1 + P_y)$

16. $T_{u1} = \frac{H_1^1 + H_1^2}{K_1}$

17. $T_{u2} = \frac{H_2^1 + H_2^2}{K_2}$

18. $T_{u3} = \frac{H_3^1 + H_3^2}{K_3}$

19. $T_{u4} = \frac{H_4^1 + H_4^2}{K_4}$

20. $T_{u5} = \frac{H_5^1 + H_5^2}{K_5}$

21. $T_{u6} = \frac{H_6^1 + H_6^2}{K_6}$

22. $T_{u7} = \frac{H_7^1 + H_7^2}{K_7}$

23. $T_{ua} = \frac{H_a^1 + H_a^2}{K_a}$

24. $T_{uu} = \frac{H_u^1 + H_u^2}{K_u}$

25. $T_{u10} = \frac{H_{10}^1 + H_{10}^2}{K_{10}}$

26. $T_{uf} = \frac{H_f^1 + H_f^2}{K_f}$

27. $T_{ur} = \frac{H_r^1 + H_r^2}{K_r}$

28. $T_{ug} = \frac{H_g^1 + H_g^2}{K_g}$

29. $T_{fh} = \frac{H_{fh}^1 + H_{fh}^2}{K_{fh}}$

30. $T_{uy} = \frac{H_y^1 + H_y^2}{K_y}$

31. E_1^t = exogenious factor

32. E_2^t = " "

33. E_3^t = " "

34. E_4^t = " "

35. E_5^t = " "

36. E_6^t = " "

37. E_7^t = " "

38. E_a^t = exogenious factor

39. E_u^t = " "

40. E_{10}^t = " "

41. E_f^t = " "

42. E_r^t = " "

43. E_g^t = " "

44. E_{fh}^t = " "

45. E_y^t = " "

The following symbols stand for given constants in the system of equations (see definitions below):

H_1^1, H_1^2, H_2^1, H_2^2, H_3^1, H_3^2, H_4^1, H_4^2, H_5^1, H_5^2, H_6^1, H_6^2, H_7^1, H_7^2, H_a^1, H_a^2,

H_u^1, H_u^2, H_{10}^1, H_{10}^2, H_f^1, H_f^2, H_r^1, H_r^2, H_g^1, H_g^2, H_{fh}^1, H_{fh}^2, H_y^1, H_y^2

K_1, K_2, K_3, K_4, K_5, K_6, K_7, K_a, K_u, K_{10}, K_f, K_r, K_g, K_{fh}, K_y,

P_b, P_u, P_{10}, P_f, P_r, P_g, P_y, T_r, T_a^b, T_a^u, T_a^f, T_a^r, T_a^g, T_a^y, A_b, B_b,

A_u, B_u, A_f, B_f, A_r, B_r, A_g, B_g, A_y, B_y.

Variables (definitions)

1. L^t = Total "system requirements" for teachers at the time t.
2. l_1 = "System requirements" for teachers per pupil in primary schools with 1 class.
3. l_2 = "System requirements" for teachers per pupil in primary schools with 2 classes.
4. l_3 = "System requirements" for teachers per pupil in primary schools with 3 classes.
5. l_4 = "System requirements" for teachers per pupil in primary schools with 4 classes.
6. l_5 = "System requirements" for teachers per pupil in primary schools with 5 classes.
7. l_6 = "System requirements" for teachers per pupil in primary schools with 6 classes.
8. l_7 = "System requirements" for teachers per pupil in primary schools with 7 classes.
9. l_a = "System requirements" for teachers per pupil in the 7th grade of primary school.
10. l_u = "System requirements" for teachers per pupil in the 7th - 9th grade of lower level secondary.
11. l_{10} = "System requirements" for teachers per pupil in the 10th grade of lower level secondary.
12. l_f = "System requirements" for teachers per pupil in the continuation school.
13. l_r = "System requirements" for teachers per pupil in the "realskole" (lower level secondary, old type).
14. l_g = "System requirements" for teachers per pupil in the gymnas (upper level secondary general).
15. l_y = "System requirements" for teachers per pupil in vocational schools.
16. m_{u1} = Teacher "hours" per pupil per year spent on teaching, in primary schools with 1 class.

17. T_{u2} = Teacher "hours" per pupil per year spent on teaching, in primary schools with 2 classes.

18. T_{u3} = Teacher "hours" per pupil per year spent on teaching, in primary schools with 3 classes.

19. T_{u4} = Teacher "hours" per pupil per year spent on teaching, in primary schools with 4 classes.

20. T_{u5} = Teacher "hours" per pupil per year spent on teaching, in primary schools with 5 classes.

21. T_{u6} = Teacher "hours" per pupil per year spent on teaching, in primary schools with 6 classes.

22. T_{u7} = Teacher "hours" per pupil per year spent on teaching, in primary schools with 7 classes.

23. T_{ua} = Teacher "hours" per pupil per year spent on teaching in the 7th grade of primary school.

24. T_{uu} = Teacher "hours" per pupil per year spent on teaching in the 7th - 9th grads of lower level secondary.

25. T_{u10} = Teacher "hours" per pupil per year spent on teaching in the 10th grade of lower level secondary.

26. T_{uf} = Teacher "hours" per pupil per year spent on teaching in the continuation school.

27. T_{ur} = Teacher "hours" per pupil per year spent on teaching in the "realskole" (lower level secondary, old type).

28. T_{ug} = Teacher "hours" per pupil per year spent on teaching in the gymnas (upper level secondary general).

29. T_{fh} = Teacher "hours" per pupil per year spent on teaching in "peoples high schools".

30. T_{uy} = Teacher "hours" per pupil per year spent on teaching in vocational schools.

31. E_1^t = Pupils in grades 1-6 in primary schools with one class at the time t.

32. E_2^t = Pupils in grades 1-6 in primary schools with 2 classes at the time t.

33. E_3^t = Pupils in grades 1-6 in primary schools with 3 classes at the time t.

34. E_4^t = Pupils in grades 1-6 in primary schools with 4 classes at the time t.

35. E_5^t = Pupils in grades 1-6 in primary schools with 5 classes at the time t.

36. E_6^t = Pupils in grades 1-6 in primary schools with 6 classes at the time t.

37. E_7^t = Pupils in grades 1-6 in primary schools with 7 classes at the time t.

38. E_a^t = Pupils in the 7th grade of primary school at time t.

39. E_u^t = Pupils in the 7th-9th grade of lower secondary at time t.

40. E_{10}^t = Pupils in the 10th grade of lower level secondary at time t.

41. E_f^t = Pupils in the continuation school at time t.

42. E_r^t = Pupils in the "realskole" (lower level secondary, old type) at time t.

43. E_g^t = Pupils in the gymnas (upper level secondary general) at time t.

44. E_{fh}^t = Pupils in "peoples high schools" at time t.

45. E_y^t = Pupils in vocational schools at time t.

46. H_1^1 = Average number of hours taught in full class per year and per class in primary schools with 1 class (grades 1-6).

47. H_1^2 = Average number of hours taught in divided classes (- hours taught in combined classes) per year and per class in primary schools with one class (grades 1-6).

48. H_2^1 = Average number of hours taught in full class per year and per class in primary schools with 2 classes (grades 1-6).

49. H_2^2 = Average number of hours taught in divided classes (- hours taught in combined classes) per year and per class in primary schools with 2 classes (grades 1-6).

50. H_3^1 = Average number of hours taught in full class per year and per class in primary schools with 3 classes (grades 1-6).

51. H_3^2 = Average number of hours taught in divided classes (- hours taught in combined classes) per year and per class in primary schools with 3 classes (grades 1-6).

52. H_4^1 = Average number of hours taught in full class per year and per class in primary schools with 4 classes (grades 1-6).

53. H_4^2 = Average number of hours taught in divided classes (- hours taught in combined classes) per year and per class in primary schools with 4 classes (grades 1-6).

54. H_5^1 = Average number of hours taught in full class per year and per class in primary schools with 5 classes (grades 1-6)

55. H_5^2 = Average number of hours taught in divided classes (- hours taught in combined classes) per year and per class in primary schools with 5 classes (grades 1-6).

56. H_6^1 = Average number of hours taught in full class per year and per class in primary schools with 6 classes (grades 1-6).

57. H_6^2 = Average number of hours taught in divided classes (- hours taught in combined classes) per year and per class in primary schools with 6 classes (grades 1-6).

58. H_7^1 = Average number of hours taught in full class per year and per class in primary schools with 7 classes (grades 1-6).

59. H_7^2 = Average number of hours taught in divided classes (- hours taught in combined classes) per year and per class in primary schools with 7 classes (grades 1-6).

60. H_a^1 = Average number of hours taught in full class per year and per class in the 7th grade of primary school.

61. H_a^2 = Average number of hours taught in divided classes (- hours taught in combined classes) per year and per class in the 7th grade of primary school.

62. H_u^1 = Average number of hours taught in full class per year and per class in the 7th-9th grades of lower level secondary.

63. H_u^2 = Average number of hours taught in divided classes (- hours taught in combined classes) per year and per class in the 7th-9th grades of lower level secondary.

64. H_{10}^1 = Average number of hours taught in full class per year and per class in the 10th grade of lower level secondary.

65. H_{10}^2 = Average number of hours taught in divided classes (- hours taught in combined classes) per class and per year in the 10th grade of lower level secondary.

66. H_f^1 = Average number of hours taught in full class per year and per class in the continuation school.

67. H_f^2 = Average number of hours taught in divided classes (- hours taught in combined classes) per year and per class in the continuation school.

68. H_r^1 = Average number of hours taught in full class per year and per class in the "realskole" (lower level secondary, old type).

69. H_r^2 = Average number of hours taught in divided classes (- hours taught in combined classes) per year and per class in the "realskole" (lower level secondary, old type).

70. H_g^1 = Average number of hours taught in full class per year and per class in the gymnas (upper level secondary general).

71. H_g^2 = Average number of hours taught in divided classes (- hours taught in combined classes) per year and per class in the gymnas (upper level secondary general).

72. H^1_{fh} = Average number of hours taught in full class per year and per class in "peoples high schools".

73. H^2_{fh} = Average number of hours taught in divided classes (- hours taught in combined classes) per year and per class in "peoples high schools".

74. H^1_y = Average number of hours taught in full class per year and per class in vocational schools.

75. H^2_y = Average number of hours taught in divided classes (- hours taught in combined classes) per year and per class in vocational schools.

76. K_1 = Average class size in primary schools with 1 class

77. K_2 = " " " " " " " 2 classes.

78. K_3 = " " " " " " " 3 "

79. K_4 = " " " " " " " 4 "

80. K_5 = " " " " " " " 5 "

81. K_6 = Average class size in primary schools with 6 classes.

82. K_7 = " " " " " " " 7 "

83. K_a = " " " " the 7th grade of primary school.

84. K_u = " " " " the 7th-9th grades of lower level secondary.

85. K_{10} = " " " " the 10th grade of lower level secondary.

86. K_f = " " " " the continuation schools.

87. K_r = " " " " the "realskole" (lower level secondary, old type).

88. K_g = " " " " the gymnas (upper level secondary general).

89. K_{fh} = " " " " the "peoples high schools".

90. K_y = " " " " the vocational schools.

91. P_b = Teaching personnel on leave (illness, birth leave, military service, etc.) as a percentage of personnel in service in primary school.

92. P_u = Teaching personnel on leave (illness, birth leave, military service, etc.) as a percentage of personnel in service in lower level secondary 7th-9th grades.

93. P_{10} = Teaching personnel on leave (illness, birth leave, military service, etc.) as a percentage of personnel in service in lower level secondary 10th grade.

94. P_f = Teaching personnel on leave (illness, birth leave, military service, etc.) as a percentage of personnel in service in the continuation school.

95. P_r = Teaching personnel on leave (illness, birth leave, military service, etc.) as a percentage of personnel in service in the "realskole" (lower level secondary, old type).

96. P_g = Teaching personnel on leave (illness, birth leave, military service, etc.) as a percentage of personnel in service in the gymnas (upper level secondary general.

97. P_y = Teaching personnel on leave (illness, birth leave, military service, etc.) as a percentage of personnel in service in vocational schools.

98. T_r = Average number of hours (expressed in terms of reduced teaching obligations) spent on pedagogical supervision per pupil and per year in compulsory education.

99. T_a^b = Average number of "administration hours" (expressed in terms of reduced teaching obligations) per pupil and per year in primary education.

100. T_a^u = Average number of "administration hours" (expressed in terms of reduced teaching obligations per pupil and per year in lower level secondary.

101. T_a^f = Average number of "administration hours" (expressed in terms of reduced teaching obligations) per pupil and per year in the continuation school.

102. T_a^r = Average number of "administration hours" (expressed in terms of reduced teaching obligations) per pupil and per year in the "realskole" (lower level secondary, old type).

103. T_a^g = Average number of "administration hours" (expressed in terms of reduced teaching obligations) per pupil and per year in the gymnasium (upper level secondary general).

104. T_a^y = Average number of "administration hours" (expressed in terms of reduced teaching obligations) per pupil and per year in vocational schools.

105. A_b = Teaching obligations per week in primary school (full post).

106. B_b = Number of school weeks a year in primary school (full post).

107. A_u = Teaching obligations per week in lower level secondary (full post).

108. B_u = Number of school weeks a year in lower level secondary (full post).

109. A_f = Teaching obligations per week in the continuation school (full post).

110. B_f = Number of school weeks a year in the continuation school (full post).

111. A_r = Teaching obligations per week in the "realskole" (lower level secondary, old type) (full post).

112. B_r = Number of school weeks a year in the "realskole" (lower level secondary, old type) (full post).

113. A_g = Teaching obligations per week in the gymnasium (upper level secondary general) (full post).

114. B_g = Number of school weeks a year in the gymnasium (upper level secondary general) (full post).

115. A_y = Teaching obligations per week in vocational schools (full post).

116. B_y = Number of school weeks a year in vocational schools (full post).

2. Dynamic models for pupil numbers.

Equations

1. $E^t = E_1^t + E_2^t + E_3^t + E_4^t + E_5^t + E_6^t + E_7^t + E_a^t + E_u^t + E_{10}^t + E_f^t + E_r^t + E_g^t + E_{fh}^t + E_y^t$

2. $E_i^t = e_i^t \cdot E_b^t \quad i = (1.....7)$

3. $E_b^t = a^{12}_{i=7} \; X^{t-i}$

4. $e_i^t = C_i(t-t_o) + e_i^{to} \quad i = (1....6)$

5. $^{7}_{i=1} \; e_i^t = 1$

6. $E_a^t = r \cdot X^{t-13} \; (1-e_{u7}^t)$

7. $E_{u7}^t = o_{u7}^t \cdot r \cdot X^{t-13}$

8. $E_{u8}^t = s_1 \cdot E_{u7}^{t-1} + s_2 \cdot E_a^{t-1}$

9. $E_{u9}^t = s_3 \cdot E_{u8}^{t-1}$

10. $E_u^t = E_{u7}^t + E_{u8}^t + E_{u9}^t$

11. $E_{u10}^t = o_{u10}^t \cdot E_{u9}^{t-1}$

(12. $e_{u10}^t = c_{u10}(t-t_o) + e_{u10}^{t_o} = 1$)

13. $E_g^t = E_{g1}^t + E_{g2}^t + E_{g3}^t$

14. $E_{g1}^t = e_a^t \cdot E_{u9}^t + e_b^t \cdot E_{u10}^{t-1} + e_c^t \cdot E_r^{t-1}$

15. $E_{g2}^t = e_{g2}^t \cdot E_{g1}^{t-1}$

16. $E_{g3}^t = e_{g3}^t \cdot E_{g2}^{t-1}$

17. E_r^t = exogenious factor

18. E_f^t = " "

19. E_{fh}^t " "

20. E_y^t = " "

21. X^{t-i} = " "

22. X^{t-13} = " "

23. e_{u7}^t = " "

24. e_a^t = " "

25. e_b^t = " "

26. e_c^t = " "

27. e_{g2}^t = " "

28. e_{g3}^t = " "

The following symbols: a, c_i, e_i^{to}, r, s_1, s_2, s_3, C_{u10}, e_{u10}^{to} stand for given constants within the equation system.

List of Variables.

Most symbols of the E^t-type are defined in the list of variables under section 1. In the present section, the following additional E^t-type symbols are introduced:

E_b^t = Total number of pupils in grade 1 to 6 in primary schools. $(= E_1^t + E_2^t + E_3^t + E_4^t + E_5^t + E_6^t + E_7^t)$

E_{u7}^t = Pupils in grade 7 of lower level secondary year t.

E^t_{u8} = Pupils in grade 8 in lower level secondary year t.

E^t_{u9} = Pupils in grade 9 in lower level secondary year t.

E^t_{U10} = Pupils in grade 10 of lower level secondary year t.

E^t_{g1} = Pupils in grade 1 of the "gymnasium" year t.

E^t_{g2} = Pupils in grade 2 of the "gymnasium" year t.

E^t_{g3} = Pupils in grade 3 of the "gymnasium" year t.

X^{t-i} = Number of living babies born year t-i.

X^{t-13} = Number of living babies born year t-13.

e^t_i = Proportion of primary school pupils (grade 1-6) in school type i year t.

e^t_{u7} = Pupils in 7th grade of lower level secondary as a percentage of the age group 13 years of age year t.

e^t_{u10} = Transfer frequency from 9th to 10th year of lower level secondary, year t.

e^t_a = Transfer frequency from 9th grade of lower level secondary to 1st grade of the "gymnasium" year t.

e^t_b = Transfer frequency from 10th grade of lower level secondary to 1st grade of the "gymnasium" year t.

e^t_c = Transfer frequency from the "realskole" to the 1st grade of the "gymnasium" year t.

e^t_{g2} = Transfer frequency from 1st to 2nd grade of the "gymnasium" year t.

e^t_{g3} = Transfer frequency from 2nd to 3rd grade of the "gymnasium" year t.

Structural constants

a and r are determined by existing death rates. a signifies the number of children of age 7 to 12 as a percentage of the corresponding generations of babies born. b signifies the probability for a newborn baby to reach the age of 13 (survival probability).

s_1, s_2, s_3 are transfer frequencies from 7th to 8th grade in lower level secondary, from 7th grade primary to 8th grade in lower level secondary (7+2 grades system) and from 8th to 9th grade in lower level secondary.

The constants e_i^{to} and e_{u10}^{to} are structural coefficients determined by the school system. C_i are estimated constants in an assumed linear relationship between such structural coefficients and time (see equations 4 and 12).

3. A model for the stock of active teachers

There are more ways of approaching this problem. The choice of model can be regarded as a question of finding an optimal response to the wish for maximum information at minimum costs. In a memo of 10th December, 1963(1), Dosent Thonstad has proposed one model of this type. His proposal is very simple, but includes certain central factors for a stock analysis, such as age distribution, type of teacher training, death rates and total work participation rate.

The main weakness of this model is in our view the lacking specification of employment according to branches of the economy, among which we are particularly concerned with the education branch. However, no major methodological problems are involved in the introduction of such a specification in the Thonstad model.

In doing this, the use of a Markow chain model seems advisable. A sketch of such a model is presented below.

The basic principle of Markow chain reasoning is the definition of a number of activities, the characteristics of which are that at any time our statistical units can belong to one, but only one, of those activities. We then define certain observable transfer proportions from one year to the next, as follows:

S_{KJ} = The proportion of persons in activity K who next year are found in activity J.

Those proportions can be arranged in a transfer matrix as follows:

$$S = \begin{array}{l} S_{11},\ S_{12},\ \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ S_{1n} \\ '' \\ '' \\ '' \\ '' \\ S_{n1},\ S_{n2},\ \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ S_{nn} \end{array}$$

Per definition, all line totals in S equal one.

---

(1) Printed as an annex to "Rapport om et forsøk på å lage en simultan prognosemodel for skolesøkningen i Norge", (Oslo, 1964).

We then define the following symbols:

$N_K(t)$ = Number of persons in activity K year t.

$N_{KJ}(t)$ = Number of persons in activity K year t, who will be in activity J next year.

According to the definition of the transfer matrix S, the following relationship exists:

$$N_i(t+1) = {}_{K=1}^{n}N_K(t) \cdot S_{K_i} + X_i(t)$$

$X_i(t)$ signifies persons entering from "outside", e.g. in this case new graduates from teacher training, and $N_K(t)$ signifies the number of teachers in the different activities.

We can now, aided by the matrix S, calculate teacher stocks for each year ahead, starting from $N_K(t)$ and assumptions concerning $X_i(t)$.

In our case, the units are persons graduated from teacher training, of each age group from 21 to 69. The next 49 activities are such persons not active as teachers, in the same age groups. This provides us with a square 98 lines matrix (of the order 98 · 98).

To this must be added a column for death and possibly also one for migration, and a line for new entry and possibly one for migration.

Of prime interest in this context is the number of teachers in the first 49 activities at any given point of time, e.g. the stock of active teachers. The matrix also provides us with the age composition of this stock for each year ahead.

This analysis must be carried out separately for male and female teachers. It may also be necessary to analyse separately teachers with different types of teacher training.

It should be noted that according to the way the S matrix has been defined, transfer from one activity to another is only dependent upon one single criterion: what activity a person belonged to the previous year. The broader "prehistory" of the person does not enter the picture.

A broader spectrum of characteristics attached to each person might have brought out various explanatory factors which tend to disappear in this simplified model. However, as a first approach, our simplified matrix might be preferable for the following reasons:

1. Problems of obtaining data must restrict the scope of the analysis in the first round.
2. Information needed in order to work out a more refined model might be provided by the proposed first approach.
3. The introduction of more activities increases the calculation operations substantially.

Finally, it should be pointed out that many of the S_{KS}-coefficients in practice will equal zero. This is for instance true for all elements in the diagonal of the matrix S, since a specific year of age is chosen as a characteristic of each activity.

TURQUIE

NOTE SUR LA FORMATION DES ENSEIGNANTS

A. Formation des enseignants de l'enseignement primaire

Il existe actuellement deux types d'écoles normales se situant au niveau secondaire :

1. Le premier type se rencontre principalement dans les régions urbanisées ; la durée des études dans ces écoles est de trois années. Les titulaires du diplôme de l'école moyenne (3 années d'études après les 5 années d'enseignement primaire) y accèdent après avoir satisfait à un examen d'entrée.

2. Le second type ne se rencontre que dans les régions rurales ; la durée des études y est de 6 années. Les titulaires du certificat de fin d'études primaires y accèdent après avoir satisfait à un examen d'entrée. Le programme des trois premières années correspond à celui de l'école moyenne.

Les diplômés des écoles normales primaires peuvent, après un examen d'entrée, accéder aux instituts d'éducation formant des enseignants principalement destinés au premier cycle de l'enseignement secondaire (écoles moyennes). Les meilleurs élèves des dernières classes des écoles normales primaires peuvent également être admis dans une classe spéciale organisée au sein de l'école normale supérieure afin de se préparer en même temps aux examens de fin d'études du lycée, ce qui leur permet ensuite de poursuivre leurs études à l'école normale supérieure, formant les professeurs de l'enseignement secondaire long (lycées et 2ème cycle).

On peut également obtenir le diplôme des écoles normales sans en suivre les cours. On se présente à un examen pour la préparation duquel, les écoles normales organisent des cours centrés sur la formation professionnelle. Les bénéficiaires de cette législation, datant de 1955, sont les suivants :

- diplômés des écoles professionnelles à cinq classes (faisant suite à l'enseignement primaire) et diplômés de l'école moyenne : l'examen porte sur toutes les matières enseignées au cours des 4ème, 5ème et 6ème années d'école normale.

- diplômés des lycées commerciaux : l'examen porte sur les matières à caractère professionnel enseignées à l'école normale.

Un projet de loi actuellement devant le Parlement prévoit de prolonger les études dans les écoles normales primaires. Les écoles normales primaires verraient la durée de leurs études prolongée d'une année, soit de 6 à 7 années pour celles situées dans les zones rurales et de 3 à 4 années pour les autres écoles normales primaires. L'objectif de cette réforme est d'élever la qualification des maîtres, d'améliorer l'ensemble de leur statut et de faciliter des transferts d'élèves du deuxième cycle de l'enseignement secondaire général et technique, grâce à un remodelage des programmes.

B. Formation des enseignants de l'enseignement secondaire général

Ecoles normales moyennes : ces écoles appelées aussi "instituts pédagogiques" ou "instituts d'éducation" ont pour objectif de former des enseignants pour l'enseignement secondaire général, en particulier, pour les écoles moyennes (1er cycle) et les inspecteurs primaires. Peuvent y accéder, après un examen d'entrée, les titulaires du diplôme de fin d'études du lycée et du diplôme des écoles normales primaires. La durée des études varie de deux à trois années, selon le type de spécialisation. Les sections ont été créées compte tenu de la spécialisation des enseignants. Ainsi, les sections de sciences et de lettres ont été mises au point en tenant compte de la structure des sections "lettres" et "sciences" dans les écoles secondaires. En dehors de ces deux sections, il existe des sections de français, anglais, allemand, dessin et travaux manuels, éducation physique, musique, pédagogie. Ces enseignants ont le titre de professeur-adjoint ; ils sont considérés comme suppléants s'ils sont appelés à enseigner dans un lycée.

Ecoles normales supérieures et facultés universitaires : le corps enseignant des lycées et des écoles normales primaires est constitué, en général, par des diplômés des universités et, de préférence, par des diplômés des écoles normales supérieures.

Au sein des écoles normales supérieures, les étudiants suivent pendant 4 ans des cours à l'université pour leur formation générale et spécialisée et reçoivent leur formation pédagogique dans l'école même.

Si le professeur n'est pas diplômé de l'école normale supérieure même, il possède un diplôme d'université. Les facultés des lettres et des sciences offrent, en effet, deux types de "premier diplôme" dont l'un est orienté vers l'enseignement.

Un projet important actuellement à l'étude prévoit la création, au sein des universités, de facultés d'éducation ou d'instituts supérieurs des sciences d'éducation. Ces facultés ou instituts auraient, en particulier, pour but de donner une formation pédagogique aux futurs enseignants, d'organiser le perfectionnement des enseignants, de former des spécialistes et des responsables dans le domaine de l'éducation et de faire des études ou des recherches sur le développement de l'éducation en Turquie.

L'accès de l'université est réservé aux titulaires du diplôme de sortie du lycée (2ème cycle de l'enseignement secondaire général). Les écoles normales supérieures, comme on l'a noté dans A. ci-dessus, acceptent après une préparation spéciale, les meilleurs élèves des écoles normales primaires.

C. Formation des enseignants de l'enseignement secondaire technique

L'école normale supérieure de l'enseignement technique pour garçons, admet, après un examen d'entrée, les diplômés des instituts professionnels pour garçons (trois ans d'études spécialisées après le ler cycle de 3 années). La durée des études normales techniques est de 4 ans. Des contre-maîtres qualifiés de l'industrie sont recrutés pour les travaux d'atelier. Des professeurs de lycée ou d'école moyenne enseignent les matières générales.

L'école normale supérieure de l'enseignement technique pour filles admet, après un examen d'entrée, les diplômées des instituts de jeunes filles (trois ans d'études spécialisées après le ler cycle de 3 années). La durée des études normales techniques pour jeunes filles est de 4 ans.

L'école normale professionnelle pour femmes admet, après examen d'entrée, les diplômées des instituts de jeunes filles. Elle forme en deux ans les professeurs des ateliers et des divers cours de l'enseignement technique pour filles.

L'école normale supérieure de commerce forme en quatre années les professeurs des disciplines spécialisées de l'enseignement commercial. Elle recrute des élèves-professeurs diplômés des lycées commerciaux, des lycées d'enseignement général, des écoles de secrétariat et des écoles normales de 3 ans et ayant passé un examen d'entrée. Certains enseignants des matières spécialisées peuvent être diplômés de l'école des hautes études commerciales. Les autres enseignants sont recrutés de la même manière que ceux des lycées.

DONNEES STATISTIQUES

Liste des Tableaux

TABLEAU 1 Nombre d'enseignants dans l'enseignement primaire public et privé (par sexe) 1950-75.

TABLEAU 2 Nombre d'élèves dans l'enseignement primaire (public et privé) 1950-75.

TABLEAU 3 Nombre d'élèves-maîtres par sexe dans les deux types d'enseignement normal primaire 1950-65.

TABLEAU 4 Nombre d'enseignants dans l'enseignement secondaire général, public et privé (par sexe) 1950-75.

TABLEAU 5 Nombre d'élèves dans l'enseignement secondaire général (public et privé) 1950-75.

TABLEAU 6 Nombre d'élèves-professeurs par sexe dans l'enseignement normal supérieur (enseignement général) 1950-65.

TABLEAU 7a Nombre d'enseignants dans l'enseignement secondaire, technique et professionnel, public et privé (par sexe) 1950-75.

TABLEAU 7b Nombre d'enseignants dans l'enseignement secondaire, technique et professionnel public, par sexe, selon le type d'établissement.

TABLEAU 8 Nombre d'élèves dans l'enseignement secondaire, technique et professionnel (public et privé) 1950-75.

TABLEAU 9 Nombre d'élèves-professeurs par sexe dans l'enseignement normal technique supérieur (non-universitaire) 1950-65.

Tableau 1

Nombre d'enseignants dans l'enseignement primaire public et privé (par sexe) 1950-75

	1950-51		1955-56		1960-61		1965-66		(70)/1971		(75)/1976	
	MF	F	MF	F	MF	F	MF	F	MF	F	MF	F
Total	35.871	9.156	42.202	11.180	60.951	14.039	84.346	22.234	(1) 143.500	-	(1) 166.400	-
Dont enseignement privé	-	-	1.106	879	1.303	1.026	1.317	1.065	-	-	-	-

(1) Ce chiffre est celui des besoins (calculé dans le Rapport PRM, tableau 25).

Sources: 1950-51, 1955-56 (sauf enseignement privé : Rapport PRM, tableau 61) ; 1960-61 : UNESCO : L'éducation dans le Monde, Tomes II, III et IV, (70)/1971 et (75)/1976 : Projet Régional Méditerranéen - Turquie - OCDE, Paris, 1965.

Tableau 2

Nombre d'élèves dans l'enseignement primaire (public et privé) 1950-1975

	Effectifs scolaires		Population d'âge correspondant (6-11)
	Total	dont secteur privé	
1950-51	1.616.626 (a)	-	
1955-56	1.981.805 (a)	19.900 (1)	
1960-61	2.866.020 (a)	25.057 (a)	4.370.863 (2)
1965-66	3.924.326 (2)	25.727	5.098.976 (3)
1970-71	-	-	
(71)/1972	5.990.000 (b)	-	5.990.000 (b)
1975-76	-	-	
1976-77	6.820.000 (b)	-	6.820.000 (b)

(1) Calcul approché obtenu en multipliant le nombre de maîtres 1.106 par le rapport maître/élève 18 (tableaux 60 et 61 Rapport PRM).

(2) 1960.

(3) 1965.

Sources: (a) UNESCO : L'éducation dans le monde. Tomes II, III et IV.
(b) Projet Régional Méditerranéen - Turquie, OCDE, Paris, 1965.

Tableau 3

Nombre d'élèves-maîtres par sexe dans les deux types d'enseignement normal primaire
1950-1965

Années / Type de formation	(49)/1950		(55)/1956		(60)/1961		1965/1966	
	MF	F	MF	F	MF	F	MF	F
Formation en 3 ans								
Inscrits	1.825	699	3.253	1.651	8.853	4.810	24.294	13.393
Diplômés	266	194	663	399	2.204	1.210	-	-
Formation en 6 ans								
Inscrits	13.972	721	12.067	1.050	14.463	1.486	23.526	7.213
Diplômés	1.741	106	2.294	116	2.158	69	-	-
Ensemble des formations								
Inscrits	15.797	1.420	15.320	2.701	23.316	6.296	47.820	20.606
Diplômés	2.007	300	2.957	515	4.362	1.279		

Source : Le Projet Régional Méditerranéen, Turquie, OCDE, Paris, 1965.

Tableau 4

Nombre d'enseignants dans l'enseignement secondaire général, public et privé (par sexe)
1950-1975

Années scolaires / Niveau d'enseignement	1950-51		1955-56		1960-61(a)		1965-66		(70)71	(75)76
	MF	F	MF	F	MF	F	MF	F	MF	MF
I. Premier cycle public	-	-	6.100(b) (1)	2.500(b) (1)	10.829	3.277	13.576	4.532	29.600(2)	33.700(2)
privé	-	-	-	-	1.251	673	1.448	818	-	-
II. Second cycle public	1.931(b)	784(b)	2.443(b)	1.156(b)	3.094	1.355	3.726	1.656	16.700(2)	17.900(2)
privé	-	-	-	-	1.125	470	2.259	1.055	-	-
III. Total premier et second cycles public et privé	6.475(a)	2.920(a)	8.703(a)	3.841(a)	16.299	5.775	21.009	8.061	46.300(2)	51.600(2)

(1) Y compris les professeurs auxiliaires et à temps partiel.
(2) Ce chiffre est celui des besoins (calculé dans le rapport PRM, tableau 25).

Sources: (a) UNESCO : L'éducation dans le Monde. Tomes II, III et IV.
(b) Le Projet Régional Méditerranéen - Turquie, OCDE, 1965 (tableaux 40 et 46).

Tableau 5

Nombre d'élèves dans l'enseignement secondaire général (public et privé) 1950-1975

	Effectifs scolaires									Population d'âge correspondant		
	1er cycle			2ème cycle			Total général			1er cycle		2ème cycle
	Public	Privé	Total	Public	Privé	Total	Public	Privé	Total			
1950-51	65.200 (1)	-	-	21.440 (1)	-	-	-	-	89.614			
1955-56	133.200 (1)	-	-	33.412 (1)	-	-	-	-	165.195			
1960-61	274.641	16.625	291.266	67.523	8.109	75.632	348.551	24.734	373.285	(1961)	1.786.000	1.505.000
1965-66	411.910	21.300	433.210	101.789	12.867	114.656	513.699	34.167	547.866	(1967)	2.390.000	2.075.000
1970-71	-	-	696.200	-	-	250.500	-	-	946.700	(1972)	2.715.000	2.520.000
1975-76	-	-	788.700	-	-	267.900	-	-	1.056.600	(1977)	3.000.000	2.800.000

(1) Ces chiffres sont donnés à titre d'information (ils ne semblent pas correspondre au total (général) des effectifs donnés par l'UNESCO ("L'éducation dans le monde"). Tomes II et IV .

Sources: 1950-51 et 1955-56 : Totaux généraux : UNESCO : L'éducation dans le monde. Tomes II, III et IV ; effectifs scolaires des secteurs publics : Rapport PRM Turquie (tableaux 40 et 46).

Projections pour 1970-71 et 1975-76 : Rapport PRM Turquie (tableau 23).

Population d'âge correspondant : Rapport PRM - Turquie.

Tableau 6

Nombre d'élèves-professeurs par sexe dans l'enseignement normal supérieur (enseignement général) (1) 1950-1965

	(49)/1950		(55)/1956		(60)/1961		1965-1966	
	MF	F	MF	F	MF	F	MF	F
Ecoles normales moyennes (2)								
Nouveaux entrants	-	-	-	-	-	-	-	-
Inscrits	622	252	931	314	2.488	674	5.681	1.896
Diplômés	393	150	304	113	803	214	-	-
Ecoles Normales Supérieures (3)								
Nouveaux entrants	-	-	-	-	-	-	-	-
Inscrits	40	16	74	47	456	191	1.231	332
Diplômés	24	6	4	3	11	8	-	-
Total général								
Nouveaux entrants	-	-	-	-	-	-	6.912	2.228
Inscrits	662	268	1.005	361	2.667	815	-	-
Diplômés	417	156	308	116	736	179		

(1) Enseignent également, en particulier, dans le 2ème cycle de l'enseignement secondaire général, des diplômés des facultés des lettres et des sciences (option enseignement).

(2) Appelés aussi "instituts pédagogiques" ou "instituts d'éducation".

(3) La formation générale et spécialisée est donnée à l'université.

Source : Rapport PRM (tableaux 70 et 75).

Tableau 7a

Nombre d'enseignants dans l'enseignement secondaire technique et professionnel public et privé (par sexe) 1950-1975

Années scolaires / Niveau d'enseignement	1950-51		1955-56		1960-61		1965-66		1970-71	1975-76
	MF	F	MF	F	MF	F	MF	F		
Enseignement secondaire technique et professionnel										
Public	-	-	-	-	7.232	2.231	8.422	-	-	-
Privé	-	-	-	-	184 (1)	29 (1)	-	-	-	-
Total	3.729	1.297	5.258	1.836	7.416	2.260	-	-	9.600 (2)	11.500 (2)

(1) Ecoles de commerce, écoles de théologie.

(2) Ce chiffre est celui des besoins (calculé dans le rapport PRM, tableau 26) pour le lycée technique et les autres branches professionnelles.

Sources : UNESCO : L'éducation dans le monde. Tomes II, III et IV (1950 à 1960) ; pour 1970 et 1975 : Rapport PRM-Turquie (tableau 26).

Tableau 7b

Nombre d'enseignants dans l'enseignement secondaire technique et professionnel public (1), par sexe selon le type d'établissement

Années scolaires / Type d'établissement	(49)/1950		(55)/1956		(59)/1960		1965-66		1970-71	1975-76
	MF	F	MF	F	MF	F	MF	F	MF	MF
Premier cycle										
Ecoles techniques et professionnelles de garçons	-	-	-	-	-	-	-	-		
Ecoles d'agriculture	142	16	139	18	158	34	-	-		
Ecoles d'hygiène sociale	6	2	20	4	42	14	-	-		
Autres écoles professionnelles	85	28	249	64	461	89	-	-		
Total	-	-	-	-	-	-	-	-		
Deuxième cycle										
Enseignement secondaire industriel	1.169	70	1.954	89	1.904	12	-	-	6.000 lycées tech.	7.600 lycées tech.
Autres écoles professionnelles	-	-	282	86	421	153	-	-	3.600 autres branches prof.	3.900 autres branches prof.
Ecoles d'agriculture (2)	21	1	88	9	93	10	-	-	-	-
Ecoles d'hygiène sociale	83	42	177	99	201	101	-	-	-	-
Total	-	-	2.501	283	2.619	186			9.600	11.500

(1) Dans l'enseignement privé du premier cycle : il y avait en 1959-60, 21 enseignants de théologie, le nombre d'enseignants d'enseignement commercial n'est pas indiqué dans le tableau 62 du Rapport PRM ; au niveau du second cycle, il y avait, pour 1959-60, 44 enseignants de théologie, 68 enseignants dans les écoles d'infirmiers, 57 enseignants dans les écoles de commerce et de journalisme ; le nombre d'enseignants de l'enseignement commercial n'est pas donné dans le tableau 62 du Rapport PRM.

(2) A l'exclusion des écoles ménagères.

Source : Rapport PRM.

Tableau 8

Nombre d'élèves dans l'enseignement secondaire technique et professionnel (public et privé) 1950-1975

Années scolaires	EFFECTIFS SCOLAIRES (1)									
	1er cycle			2ème cycle			Années scolaires	Total général (b)		
	Public (a)	Privé	Total	Public (a)	Privé	Total		Public	Privé	Total
1949-50	18.093(4)	-	-	10.586(4)	-	-	1950-51	-	-	36.702
1955-56	30.946(4)	-	-	13.956(4)	-	-	1955-56	-	-	71.497
1959-60	30.323(4)	(2)	-	27.280(4)	(2)	-	1960-61	83.641	1.387(3)	85.088
1965-66		-			-	-	1965-66	121.320(5)	-	-
1970-71	-	-	-	-	-	-	1970-71			78.700(6) 116.300(7) 195.000
1975-76	-	-	-	-	-	-	1975-76			99.100(6) 128.400(7) 227.500

(1) D'après le rapport PRM l'ensemble des formations techniques et professionnelles se situerait au niveau du 2ème cycle pour 1970 et 1975 ; la population d'âge correspondant serait à peu près la même que celle indiquée au tableau 5.

(2) Il y avait 277 élèves dans les écoles de théologie et de commerce du 1er cycle et 1.460 élèves dans le 2ème cycle (écoles de commerce, de théologie, d'infirmerie, de commerce et de journalisme) en 1959-60 selon le tableau 62 du Rapport PRM.

(3) Ecoles de théologie et de commerce uniquement.

(4) Afin de pouvoir comparer les données sur les élèves à celles sur les enseignants, on a subdivisé les données sur les élèves par type d'établissement :

	(49)/1950	(55)/1956	(59)/1960	Types d'établissements
1er cycle	13.685	22.032	19.139	Ecoles techniques et professionnelles de garçons
	1.828	1.774	1.776	Ecoles d'agriculture
	284	361	497	Ecoles d'hygiène sociale
	2.296	6.779	8.911	Autres écoles professionnelles
Total	18.093	30.946	30.323	
2ème cycle	7.649	8.026	18.744	Enseignement secondaire industriel
	1.971	4.332	6.824	Autres écoles professionnelles
	203	699	675	Ecoles d'agriculture
	763	899	1.037	Ecoles d'hygiène sociale
Total	10.586	13.956	27.280	

(5) Source : "Le mouvement éducatif en 1966-67" - Turquie - BIE (Genève).

(6) Enseignement technique.

(7) Enseignement professionnel.

Sources : (a) Rapport PRM.
(b) UNESCO : L'éducation dans le monde, Tomes II, III et IV.

Tableau 9

Nombre d'élèves-professeurs par sexe dans l'enseignement normal technique supérieur (non-universitaire) 1950-1965

	(49)/1950		(55)/1956		(60)/1961		1965-66	
	MF	F	MF	F	MF	F	MF	F
Inscrits	874	404	613	316	1.289	641	2.049	768
Diplômés	142	51	148	91	187	108	-	-

Source : Rapport PRM (tableau 71).

UNITED STATES

NOTE ON TEACHER TRAINING

Each of the fifty states and equivalent political subdivisions which constitute the United States, has its own requirements for teacher certification. The academic programmes for teacher training, in an institution of higher education, reflect, in large measure, the specific certification requirements of the state in which the student plans to teach.

As these requirements are not very different from one state to another, the American teacher can move from one state to another. One interesting fact regarding teacher education in the United States is that both elementary and secondary teachers are frequently prepared in the same institution.

Teacher training is offered in a large variety of higher education institutions. Only about 20 per cent of teachers new to the schools receive their training in what may be classified strictly as teachers' colleges. Approximately 50 per cent are prepared in public general colleges and universities. A sizeable proportion of these public general colleges were previously teachers' colleges which were converted into multi-purpose institutions offering liberal arts and professional courses in addition to teacher training. The rest of the new teaching force is trained in private colleges and universities. As the institutions offering teacher training programmes are numerous, the range in standards is extremely wide, due to differences in facilities, number and qualifications of staff members, and to state certification requirements. An autonomous, voluntary accrediting body "The National Council for Accreditation of Teachers' Education", has been created in 1952. It aims at the evaluation and accreditation of teachers' education programmes. It tries to raise standards to a defensible height. In 1963, about 80 per cent of the teachers for the public schools were trained in institutions accredited by the National Council. Considerable improvements are to be anticipated.

Primary Teacher Training

A bachelor's degree representing four years' preparation beyond high school is almost universally required to teach in a primary schools. It is estimated that approximately 80 per cent of the primary school teachers have at least a bachelor's degree; about 18 per cent of the primary school teachers hold a master's degree.

Entrance requirements vary but most colleges and universities require graduation from accredited high schools. Entrance requirements can be:

- recommendations from the high school from which the candidate graduated;
- some of the results of standardised tests;
- use of aptitude test to determine if the candidate possesses the necessary qualifications for a teaching career.

In a typical four-year programme for a bachelor's degree approximately by three-quarters of the student's work is in general liberal arts courses and one-quarter is in professional education courses including practice teaching. A fifth year of college or university puts the major emphasis on professional courses concerned with methods of teaching the elementary school curriculum and with the learning problems of elementary school children. A master's degree in education is generally awarded for this year of higher education beyond the bachelor's degree.

Secondary Teacher Training

All states require at least the bachelor's degree for secondary teaching; a very small number of states require five years of higher education (master's degree). It is estimated that today about 40 per cent of the secondary school teachers hold master's degrees. The entrance requirements are similar to those mentioned above for primary teachers.

In a typical four-year programme for a bachelor's degree for secondary teaching training, approximately half of the student-teacher's work is devoted to liberal or general education; one-third of the remaining half is devoted to the student's field of specialisation, the subject or the subjects he plans to teach; one third to professional education courses (pedagogy), including teaching practice; and one-third to elective courses.

Roughly a half of the fifth year of academic work is spent in advanced study in the subject or subjects he wants to teach; the other half is devoted to professional education courses. All teachers of vocational subjects are required to complete specialised training. Teachers in trade and industrial education are required to have had a first-hand experience in the trade to be taught. The amount of experience required before entry to teacher training programme varies in the different states.

The teachers of agricultural subjects must have considerable farm experience before attending teacher training courses in agricultural education at the land-grant colleges or universities. Teachers of industrial or trade education are trained either at designated higher institutions or in specialised programmes conducted by the state board of vocational education. Teachers in home economics subjects are trained in higher institutions designated by the states to prepare teachers in a special curriculum developed for this purpose.

It is generally recognised in the United States that full and adequate preparation for elementary and secondary school teaching requires five years of higher education. The trend is to advocate the completion of a fifth year of higher education during the beginning teacher's first five years of service.

STATISTICAL DATA

List of Tables

TABLE 1a Number of Classroom Teachers in Regular Public and Non-public Elementary and Secondary Day Schools by Control and by Organisational Level, 1950-1975.

TABLE 1b Number of Teachers in Elementary and Secondary School by Sex, 1950-1975.

TABLE 1c Number of Teachers in Public Elementary and Secondary Schools with Substandard Credentials, 1955-1967.

TABLE 2 Number of Pupils by Organisational Level of School and by Control - Elementary - 1950-1975.

TABLE 3 Number of Pupils by Organisational Level of School and by Control - Secondary - 1950-1975.

TABLE 4a Total Enrolment in Institutions of Higher Education including Teacher Colleges by Sex and by Type of Institution, United States and outlying areas.

TABLE 4b Earned Degrees by Field in the Natural Sciences and Related Professions and in Social Sciences, Humanities and Related Professions, 1950-1975.

Table 1a

Number of Classroom Teachers(1) in Regular Public and Non-public(2) Elementary and Secondary Day Schools by Control and by Organisational Level, 1950-1975(3)

	1949-50	1955-56	1960-61	1965-66(4)	1970-71	1975-76
Elementary	665,665	827,000	984,000	1,120,000	1,244,000	1,274,000
Public	589,578	733,000	858,000	968,000	1,074,000	1,089,000
Non-public	76,087	94,000	126,000	152,000	170,000	185,000
Secondary	366,277	459,000	610,000	823,000	993,000	1,089,000
Public	324,093	408,000	550,000	749,000	907,000	998,000
Non-public	42,184	51,000	60,000	74,000	86,000	91,000

(1) Includes part-time and full-time classroom teachers (in 1965: 98 per cent of teachers in the public schools were full-time teachers). Does not include teachers in residential schools for exceptional children, sub-collegiate department of institutions of higher education, Federal schools for Indians and schools on federal installations.

(2) Instructional staff and classroom teachers are not reported separately. Data are partially estimated.

(3) The projection includes effects of Elementary and Secondary Education Act of 1965. It assumes an additional increase in classroom teachers over the number projected under the trend assumptions. This increase is based on the amount of funds made available by provisions of the Act. Sixty per cent of the added teachers are assumed to be in elementary schools and 40 per cent in secondary schools.

(4) Preliminary data that include the effect of the Elementary and Secondary Education Act of 1965 during its first year of operation.

Sources: - 1949-50: Digest of Educational Statistics, 1966 (Table 7), United States Department of Health, Education and Welfare, Office of Education.

- Other years: Projections of Educational Statistics to 1975-76.

Table 1b

Number of Teachers(1) in Elementary and Secondary Schools by Sex, 1950-1975

	1949-50		1955-56		1959-60		1963-64		1975-76	
	M F	F	M F	F	M F	F	M F	F	M F	F
Elementary schools(2)(3):	665,665	607,258	827,000	724,000	953,431	828,865	1,051,606	911,986	1,274,000	-
Public	589,578	536,653	733,000	-	833,772	716,156	906,606	775,136	1,089,000	-
Non-public	76,087	70,605	94,000	-	119,659	112,709	145,000	136,850	185,000	-
Secondary schools(3):	366,277	207,741	459,000	239,730	577,160	277,921	735,368	345,161	1,089,000	-
Public	324,093	182,050	408,000	-	521,186	246,132	661,368	304,871	998,000	-
Non-public	42,184	25,691	51,000	-	55,974	31,789	74,000	40,290	91,000	

(1) For source (a): Number of teaching positions: includes librarians and guidance and psychological personnel when not separately reported; excludes supervisors and principals; definitions not known for source (b).

(2) Including kindergartens.

(3) Including junior, senior, junior-senior, and regular high schools. Excludes sub-collegiate departments of institutions of higher education, residential schools for exceptional children and Federal schools for source (a); definitions not known for source (b).

Sources: (a) 1949-50 and 1959-60: Table 7, Digest of Educational Statistics, 1966. Office of Education, United States Department of Health, Education and Welfare.

(b) 1955-56: World Survey of Education, UNESCO (vol. III).

(c) 1963-64: Digest of Educational Statistics, 1967. Office of Education, United States Department of Health, Education and Welfare.

Table 1c

Number of Teachers in Public Elementary and Secondary Schools
with Substandard Credentials(1) 1955-1967

	1955	1960	1961	1962	1963	1964	1965	1966	1967
	M F	M F	M F	M F	M F	M F	M F	M F	M F
Elementary	729,194	858,249	869,072	886,161	908,353	940,104	964,669	1,005,376	1,040,160
Secondary	406,736	549,844	591,983	621,391	669,424	708,080	745,650	782,729	814,540
Total:	1,135,930	1,408,093	1,461,055	1,507,552	1,577,777	1,648,184	1,710,319	1,788,105	1,854,700
of which with substandard credentials	77,554	92,297	91,643	82,655	83,200	82,700	84,127	90,500	90,500
Elementary	59,453	67,702	65,654	55,960	55,000	53,500	52,947	56,500	56,500
Secondary	18,101	24,595	25,989	26,695	28,200	29,200	31,180	34,000	34,000

(1) Teachers who are not fully certificated as determined by the individual state.

Source: Projections of Educational Statistics to 1975-76, Table 24, note 3.

Table 2

Number of Pupils by Organisational Level of School and by Control: Elementary, 1950-1975

	Fall enrolment			School age population 5 - 13
	Public	Non-public	Total	
1949-50	19,386,806	2,707,777	22,094,583	
of which kindergarten	1,034,203	133,000		
1955-56	22,159,000	3,800,000	25,959,000	28,177,000
of which kindergarten	1,564,396			
1960-61	24,350,000	4,800,000	29,150,000	33,064,000
of which kindergarten	2,000,000	356,000		
1965-66	26,670,000	5,300,000	31,970,000	36,035,000
of which kindergarten	2,257,912	613,000		
1970-71	27,300,000	5,000,000	32,300,000	37,108,000
of which kindergarten				
1975-76	25,200,000	4,900,000	30,100,000	35,267,000
of which kindergarten				

Source: 1949-50: Digest of Educational Statistics 1967 (Table 3: kindergarten and grade 1-8, public and non-public).

1955-56 - 1975-76: Projections of Educational Statistics to 1976-77 (Table 3 for enrolments, Table 3, appendix for school age population). Kindergarten enrolments from United States Bureau of the Census, Current Population Reports, Series P-20, for 1960-61 and 1965-66.

Table 3

Number of Pupils by Organisational Level of School and by Control: Secondary, 1950-1975

	Fall enrolment			School age population 14 - 17
	Public	Non-public	Total	
1949-1950	5,724,621	672,362	6,396,983	8,404,768
1955-1956	8,521,000	800,000	9,321,000	9,340,000
1960-1961	11,931,000	1,100,000	13,031,000	11,411,000
1965-1966	15,504,000	1,300,000	16,804,000	14,157,000
1970-1971	18,300,000	1,500,000	19,800,000	15,882,000
1975-1976	20,400,000	1,500,000	21,900,000	16,908,000

Source: See Table 2 (in 1949-1950: grades 9-12 and post-graduate public and non-public: the school age population is given in Table 33 of the 1966 Digest of Educational Statistics).

Table 4a

Total Enrolment in Institutions of Higher Education including Teacher Colleges(1)

by Sex and by Type of Institution, United States and Outlying Areas

	All students	Students taking work creditable toward a bachelor's or higher degree		Students in occupational or general studies programmes not chiefly creditable toward a bachelor's degree	
		M F	F	M F	F
1949-1950					
2-year institutions		229,211	77,882		
4-year institutions		2,227,630	650,287		
of which teachers' colleges					
1955-1956					
2-year institutions		308,976	112,021		
4-year institutions		2,369,647	819,173		
of which teachers' colleges		244,888	127,475		
1960-1961					
2-year institutions		453,617	170,325		
4-year institutions		3,156,390	1,169,042		
of which teachers' colleges		359,227	188,206		
Fall 1965					
2-year institutions	1,176,852	845,244	321,712	331,608	119,779
4-year institutions	4,790,559	4,725,027	1,851,985	65,532	21,260
of which teachers' colleges	573,502	571,695	295,527	1,807	787

(1) Teachers' colleges were 186 (public 158, private 28) fall 1965; the total numbers of institutions of higher education was 2,230 in 1965. (Source: 1966 Digest of Educational Statistics, Table 99.) Teachers are trained in universities and liberal arts colleges as well as in teachers' colleges. Here only those institutions are included whose principal object is the training of teachers.

Source: Opening Fall Enrolment in Higher Education, United States Department of Health, Education and Welfare, Office of Education.

Table 4b

Earned Degrees by Field in the Natural Sciences and Related Professions(1) and in Social Sciences, Humanities and Related Professions(2) (including education), 1950-1975

	Bachelor's and first professional degree			Master's degree			Doctor's degree		
	Sciences	Humanities		Sciences	Humanities		Sciences	Humanities	
	Total	Total	of which education	Total	Total	of which education	Total	Total	of which education
1949-50	138,285	295,449	61,725	14,367	43,852	20,069	3,236	3,184	953
1955-56	86,082	225,216	56,593	12,825	46,469	27,260	4,079	4,824	1,438
1960-61	115,261	287,488	74,865	20,307	57,962	30,830	5,070	5,505	1,594
1965-66	137,668	417,945	118,421	32,818	107,954	50,478	9,144	9,095	3,063
1970-71	189,990	566,010	130,120	59,690	133,110	53,650	13,140	11,760	3,240
1975-76	234,320	703,690	156,160	80,170	154,730	51,670	20,170	16,730	4,400

(1) Natural sciences and related professions includes mathematics and statistics, engineering, physical sciences, biological sciences, agriculture and forestry, health professions, science general programme.

(2) Social sciences, humanities and related professions include: fine arts, philosophy and religion, english and journalism, foreign languages, psychology, social sciences, education, library science, social work, other.

Sources : 1949-50: Health, Education, and Welfare Trends, 1965 Edition.
1955-75: Projections of Educational Statistics to 1975-76 (Tables 19, 20 and 21).

OCDE SALES AGENTS
DÉPOSITAIRES DES PUBLICATIONS DE L'OCDE

ARGENTINE - ARGENTINE
Editorial Sudamericana S.A.,
Humberto 1° 545, BUENOS AIRES.

AUSTRALIA - AUSTRALIE
B.C.N. Agencies Pty, Ltd.,
178 Collins Street, MELBOURNE, 3000.

AUSTRIA - AUTRICHE
Gerold & Co., Graben 31, WIEN 1.
Sub-Agent : GRAZ : Buchhandlung Jos. A. Kienreich, Sackstrasse 6.

BELGIUM - BELGIQUE
Librairie des Sciences
76-78, Coudenberg, BRUXELLES 1.
Standaard Wetenschappelijke Uitgeverij
Belgiëlei 147, ANVERS.

CANADA
Queen's Printer - L'Imprimeur de la Reine.
OTTAWA.

DENMARK - DANEMARK
Munksgaard Boghandel, Ltd., Nörregade 6
KOBENHAVN K.

FINLAND - FINLANDE
Akateeminen Kirjakauppa, Keskuskatu 2,
HELSINKI.

FORMOSA - FORMOSE
Books and Scientific Supplies Services, Ltd.
P.O.B. 83, TAIPEI,
TAIWAN.

FRANCE
Bureau des Publications de l'OCDE
2 rue André-Pascal, 75 PARIS 16^{e}
Principaux sous-dépositaires :
PARIS : Presses Universitaires de France,
49 bd Saint-Michel, 5^{e}
Sciences Politiques (Lib.). 30 rue Saint-Guillaume, 7^{e}
13 AIX-EN-PROVENCE : Librairie de l'Université.
38 GRENOBLE : Arthaud
67 STRASBOURG : Berger-Levrault.

GERMANY - ALLEMAGNE
Deutscher Bundes-Verlag G.m.b.H.
Postfach 9380, 53 BONN.
Sub-Agents : BERLIN 62 : Elwert & Meurer.
HAMBURG : Reuter-Klöckner ; und in den massgebenden Buchhandlungen Deutschlands.

GREECE - GRECE
Librairie Kauffmann, 28, rue du Stade,
ATHÈNES-132.
Librairie Internationale Jean Mihalopoulos
33, rue Sainte-Sophie, THESSALONIKI.

ICELAND - ISLANDE
Snæbjörn Jónsson & Co., h.f., Hafnarstræti 9,
P.O. Box 1131, REYKJAVIK.

INDIA - INDE
Oxford Book and Stationery Co. :
NEW DELHI, Scindia House.
CALCUTTA, 17 Park Street.

IRELAND - IRLANDE
Eason & Son, 40-41 Lower O'Connell Street,
P.O.B. 42 DUBLIN 1.

ISRAEL
Emanuel Brown,
35 Allenby Road, and 48 Nahlath Benjamin St.,
TEL-AVIV.

ITALY - ITALIE
Libreria Commissionaria Sansoni
Via Lamarmora 45, 50 121 FIRENZE.
Via P. Mercuri 19/B, 00 193 ROMA.
Sous-dépositaires :
Libreria Hoepli, Via Hoepli 5, 20 121 MILANO.
Libreria Lattes, Via Garibaldi 3, 10 122 TORINO.
La diffusione delle edizioni OCDE è inoltre assicurata dalle migliori librerie nelle città più importanti.

JAPAN - JAPON
Maruzen Company Ltd.,
6 Tori-Nichome Nihonbashi, TOKYO 103.
P.O.B. 5050, Tokyo International 100-21.

LEBANON - LIBAN
Redico
Immeuble Edison, Rue Bliss, B.P. 5641
BEYROUTH.

LUXEMBOURG
Librairie Paul Bruck, 22, Grand'Rue,
LUXEMBOURG.

MALTA - MALTE
Labour Book Shop, Workers' Memorial Building,
Old Bakery Street, VALLETTA.

THE NETHERLANDS - PAYS-BAS
W.P. Van Stockum
Buitenhof 36, DEN HAAG.
Sub-Agents : AMSTERDAM C : Scheltema & Holkema, N.V., Rokin 74-76. ROTTERDAM : De Wester Boekhandel, Nieuwe Binnenweg 331.

NEW ZEALAND - NOUVELLE-ZELANDE
Government Printing Office,
Mulgrave Street (Private Bag), WELLINGTON
and Government Bookshops at
AUCKLAND (P.O.B. 5344)
CHRISTCHURCH (P.O.B. 1721)
HAMILTON (P.O.B. 857)
DUNEDIN (P.O.B. 1104).

NORWAY - NORVEGE
A/S Bokhjörnet, Akersgt. 41, OSLO 1.

PAKISTAN
Mirza Book Agency, 65, Shahrah Quaid-E-Azam,
LAHORE 3.

PORTUGAL
Livraria Portugal, Rua do Carmo 70, LISBOA.

SPAIN - ESPAGNE
Mundi Prensa, Castelló 37, MADRID 1.
Libreria Bastinos de José Bosch, Pelayo 52,
BARCELONA 1.

SWEDEN - SUEDE
Fritzes, Kungl. Hovbokhandel,
Fredsgatan 2, STOCKHOLM 16.

SWITZERLAND - SUISSE
Librairie Payot, 6, rue Grenus, 1211 GENÈVE, 11 et à LAUSANNE, NEUCHATEL, VEVEY, MONTREUX, BERNE, BALE, ZURICH.

TURKEY - TURQUIE
Librairie Hachette, 469 Istiklal Caddesi, Beyoglu,
ISTANBUL et 12 Ziya Gókalp Caddesi, ANKARA.

UNITED KINGDOM - ROYAUME-UNI
H.M. Stationery Office, P.O. Box 569, LONDON,
S.E.1.
Branches at : EDINBURGH, BIRMINGHAM, BRISTOL, MANCHESTER, CARDIFF, BELFAST.

UNITED STATES OF AMERICA
OECD Publications Center, Suite 1305,
1750 Pennsylvania Ave, N. W.
WASHINGTON, D.C. 20006. Tel : (202) 298-8755.

VENEZUELA
Libreria del Este, Avda. F. Miranda, 52,
Edificio Galipan, CARACAS.

YUGOSLAVIA - YOUGOSLAVIE
Jugoslovenska Knjiga, Terazije 27, P.O.B. 36,
BEOGRAD.

Les commandes provenant de pays où l'OCDE n'a pas encore désigné de dépositaire peuvent être adressées à :
OCDE, Bureau des Publications, 2 rue André-Pascal, 75 Paris 16^{e}.
Orders and inquiries from countries where sales agents have not yet been appointed may be sent to
OECD, Publications Office, 2 rue André-Pascal, 75 Paris 16^{e}.

PUBLICATIONS DE L'OCDE, 2, rue André-Pascal, Paris-16^{e} - N° 25 254 - Dépôt légal n° 1928 - 1969
IMPRIME EN FRANCE